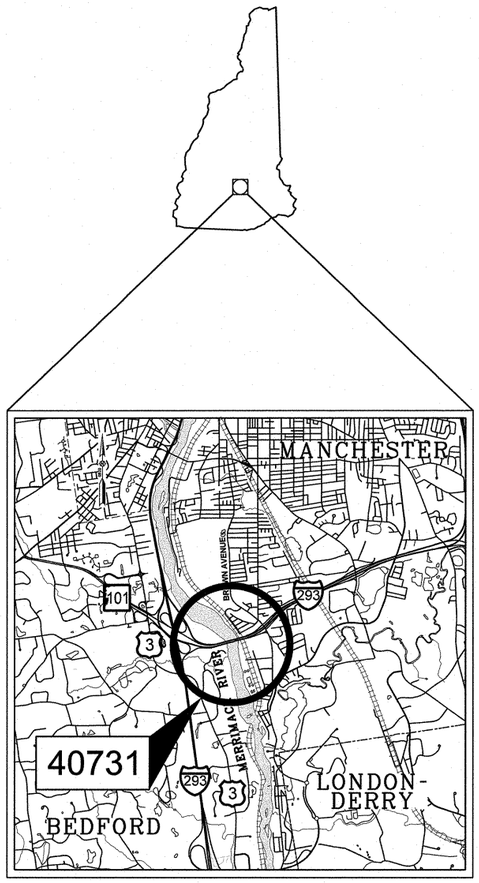
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS
FEDERAL AID PROJECT

X-A004(475)
N.H. PROJECT NO. 40731
I-293

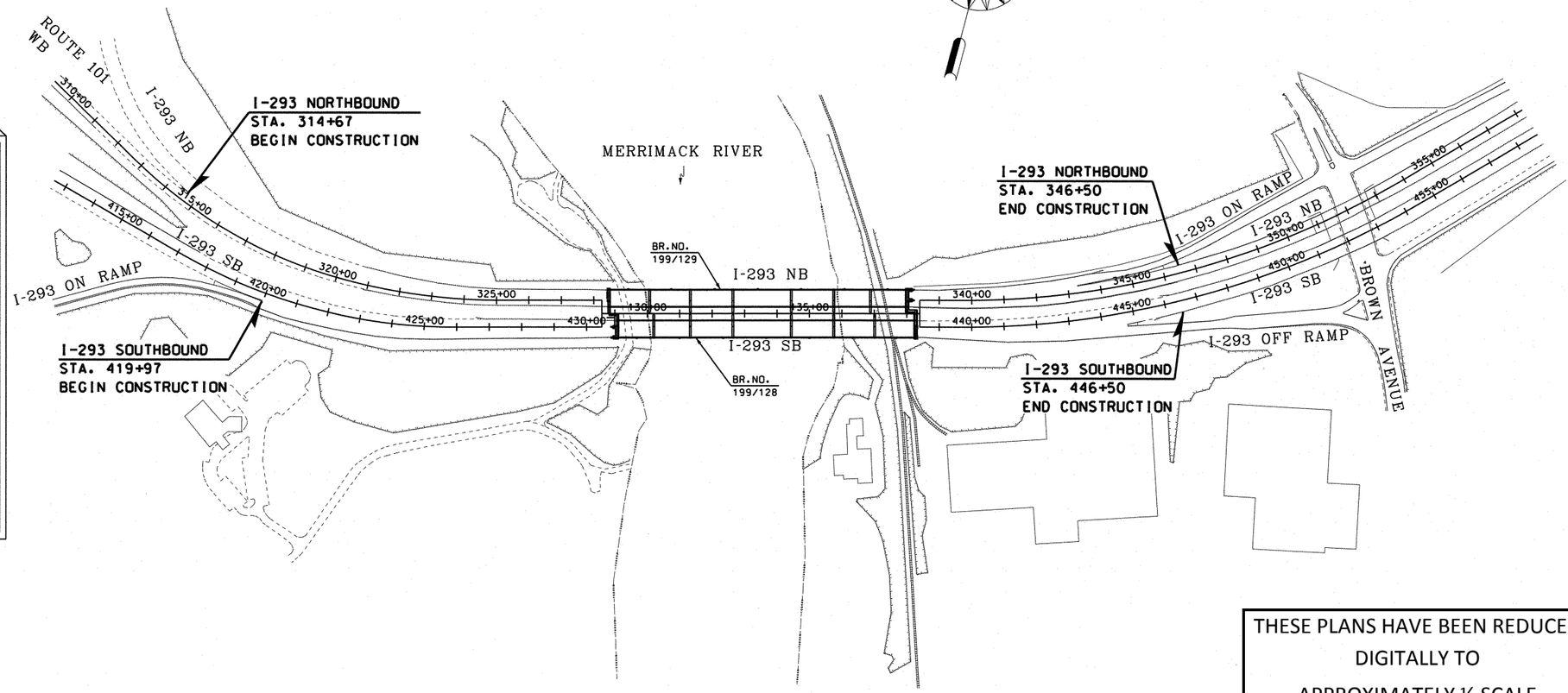
DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 17	84,000 VPD
AVERAGE DAILY TRAFFIC 20 37	108,000 VPD
PERCENT OF TRUCKS	6%
DESIGN SPEED	55 MPH
LENGTH OF PROJECT	0.56 MILES



LOCATION MAP

1 1/2 0 1 2 mi.

GRAPHIC SCALE



THESE PLANS HAVE BEEN REDUCED DIGITALLY TO APPROXIMATELY ½ SCALE

	BRIDGE DESIGN (GPI)	ITS DESIGN (VHB)	SWZ DESIGN CCTV FOUNDATION DESIGN TEMPORARY BARRIER
PLAN SHEET RESPONSIBILITY	1-21 28-36 42-46	37-39	22-27 40.41

STEPHEN R. LANGEVIN No. 11933 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE — 5/16/18

MARK D. SUENNEN No. 11858 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE — 5-23-18

ROBERT LANDRY 9475 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE

DRAWN BY RDL DATE 05/16/18

CHECKED BY JPJ DATE 05/16/18

TOWN OF BEDFORD - CITY OF MANCHESTER

COUNTY OF HILLSBOROUGH

SCALE: 1" = 200'

vhb

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services
21 Daniel Street, Second Floor, Portsmouth, NH 03801
Tel: (603) 891-2213 Fax: (978) 658-3044
http://www.gpinet.com

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:
DIRECTOR OF PROJECT DEVELOPMENT — DATE 5/25/2018

APPROVED:
ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE 5/29/18

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(475)	40731	1	46

INDEX OF SHEETS

GENERAL NOTES

1. FOR STANDARD PLANS, SEE DEPARTMENT OF TRANSPORTATION WEBSITE AT: WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/STANDARDPLANS/INDEX.HTM.
2. HIGH TENSION OVERHEAD TRANSMISSION LINES ARE LOCATED THROUGHOUT THE PROJECT WITH CROSSINGS AT VARIOUS LOCATIONS AND RUNNING ALONG THE ROAD THROUGHOUT THE PROJECT EVEN ON REGULAR POLES. THE CONTRACTOR IS ADVISED THAT EXTREME CAUTION WILL BE REQUIRED IN THE OPERATION OF EQUIPMENT, ESPECIALLY CRANES AND PILE DRIVING EQUIPMENT.
3. MODIFY SUPERELEVATION ON EXISTING CURVES BY THE USE OF A LEVELING COURSE TO THE RATES INDICATED ON THE PLANS OR AS ORDERED.
4. EXISTING DELINEATORS AND WITNESS MARKERS THAT ARE REMOVED AND DETERMINED BY THE ENGINEER TO BE IN ACCEPTABLE CONDITION SHALL BE RESET (SUBSIDIARY). ADDITIONAL DELINEATORS AND WITNESS MARKERS ORDERED WILL BE PAID UNDER THE APPROPRIATE ITEMS OF THE CONTRACT.
5. NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
6. PERFORM ALL WORK WITHIN THE EXISTING RIGHT-OF-WAY, UNLESS OTHERWISE SHOWN ON THE PLANS OR AS ORDERED BY THE ENGINEER.
7. REMOVE UNPROTECTED PROJECT MARKERS (SUBSIDIARY).
8. SURVEY DATA FOR THIS PROJECT WAS COLLECTED BY SDR AND THE FIELD NOTES CAN BE FOUND IN THE FIELD BOOK 13449. COORDINATES ARE NEW HAMPSHIRE STATE PLANE COORDINATES OF NAD83, 1986 ADJUSTMENT AND THE BEARINGS ARE GRID. ELEVATIONS ARE REFERENCED TO NGVD 1929.
9. QUANTITIES FOR EMBANKMENT AND EXCAVATION FOR SLOPE ROUNDINGS AS SHOWN ON THE TYPICALS HAVE NOT BEEN CALCULATED AND ARE NOT INCLUDED IN THE QUANTITY SUMMARIES, AND ARE CONSIDERED SUBSIDIARY TO THE APPROPRIATE 203 ITEMS.
10. REMOVE TOPSOIL FOR ITS TOTAL DEPTH WITHIN THE LIMITS OF THE SLOPE LINES. UNLESS OTHERWISE DIRECTED, STOCKPILE TOPSOIL AND USE IT ON THIS PROJECT AS NEEDED UNDER SECTION 641 - LOAM AND/OR SECTION 647 - HUMUS

THE FOLLOWING GENERAL NOTES WILL BE USED ON THIS PROJECT:											
1				5	6						

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED - DATE -
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

INDEX OF SHEETS & GENERAL NOTES

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	40731index_sheet	40731	2	46

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	DATE	STATION

SDR PROCESSED	-	DATE	-
NEW DESIGN	RDL	DATE	05/16/18
SHEET CHECKED	JPJ	DATE	05/16/18
AS BUILT DETAILS		DATE	

GENERAL

EDGE OF PAVEMENT — PROPOSED ROADWAY
TRAVELED WAY — existing roadway — (pavement removed outside slope lines)

DRIVEWAYS — (label surface type)

BUILDINGS — (building to be removed)
(label house or type of building)

FOUNDATION — (label type)

LEACH FIELD — leach field

BRIDGE CROSSINGS — STREAM — OVERPASS

STEPS AND WALK — (label type)

INTERMITTENT WATER COURSE

SHORE LINE — river/stream — pond — (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS) — (deciduous) (coniferous) (stump)
(show station, circumference in feet & type)

TREE OR STUMP (CROSS-SECTIONS)

HEDGE — (label type)

MONITORING WELL — mon W

WELL — W

FLAG POLE — fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type) — existing — PROPOSED — bgr — cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE) — (points toward retained ground)

FENCE (LABEL TYPE)

SIGNS — (single post) — (double post)

GAS PUMP — gp

FUEL TANK (ABOVE GROUND) — ft (label size & type)

STORAGE TANK FILLER CAP — fc

SEPTIC TANK — S

GRAVE — gr

MAILBOX — mb

VENT PIPE — vp

SATELLITE DISH ANTENNA — da

PHONE — ph

GROUND LIGHT/LAMP POST — gl — lp

BORING LOCATION — B

TEST PIT — TP

INTERSTATE NUMBERED HIGHWAY — 293

UNITED STATES NUMBERED HIGHWAY — 3

STATE NUMBERED HIGHWAY — 102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE — 2 PUB2E

DELINEATED WETLAND — DW
ORDINARY HIGH WATER — OHW
TOP OF BANK — TOB
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW
NORMAL HIGH WATER — NHW
WIDTH AT BANK FULL — WBF
PRIME WETLAND — PWET
PRIME WETLAND 100' BUFFER — PWET100
NON-JURISDICTIONAL DRAINAGE AREA — NJDA
COWARDIN DISTINCTION LINE — CDL
TIDAL BUFFER ZONE
DEVELOPED TIDAL BUFFER ZONE — DTBZ
HIGHEST OBSERVABLE TIDE LINE — HOTL
MEAN HIGH WATER — MHW
MEAN LOW WATER — MLW
VERNAL POOL — VP
SPECIAL AQUATIC SITE — SAS
REFERENCE LINE — REF
WATER FRONT BUFFER — WB50
NATURAL WOODLAND BUFFER — NWB150
PROTECTED SHORELAND — PS250
INVASIVE SPECIES LABEL — I.S. I — I.S. II
INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500
100 YEAR FLOODPLAIN BOUNDARY — FP100
FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE — 30 — 31 — 32

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

SLOPE LINE — CLEARING LINE

CLEARING LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) — 72.5
FINISHED GRADE ELEVATION (RIGHT) — 79.14

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	40731stdsymb1	40731	3	46

DRAINAGE

MANHOLE

CATCH BASIN — cb

DROP INLET — di

(existing) (PROPOSED)

DRAINAGE PIPE (existing) — (label size & type)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN — fb — (label size & type)

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN

show direction of flow

HEADER (existing & PROPOSED) — (with stone outlet protection)

END SECTION (existing & PROPOSED) — METAL or PLASTIC — RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE — (label type)

RR RIGHT-OF-WAY LINE

PROPERTY LINE

PROPERTY LINE (COMMON OWNER) — Z — Z

TOWN LINE — BOW / CONCORD

COUNTY LINE — COOS / GRAFTON

STATE LINE — MAINE / NEW HAMPSHIRE

NATIONAL FOREST

CONSERVATION LAND — LC

BENCH MARK / SURVEY DISK

BOUND — bnd — (PROPOSED)

STATE LINE/ TOWN LINE MONUMENT — S/L — T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN — ip

DRILL HOLE IN ROCK — dh

TAX MAP AND LOT NUMBER — 156 14 — 1642/341 — 6.80 Ac.±

PROPERTY PARCEL NUMBER — 12

HISTORIC PROPERTY — H

UTILITIES

existing PROPOSED

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

(plot point at face not center of symbol)

LIGHT POLE

LIGHT ON POWER POLE

LIGHT ON JOINT POLE

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY
AS APPLICABLE e.g.:

R L — P+04 25.0' — T+04 25.0'

RAILROAD — (label ownership)

RAILROAD SIGN

RAILROAD SIGNAL

UTILITY JUNCTION BOX — jb — JB

OVERHEAD WIRE — OW — (label type)

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned) — W — PW

SEWER

TELEPHONE

ELECTRIC — E — PE

GAS — G — PG

LIGHTING

INTELLIGENT TRANSPORTATION SYSTEM — ITS — PITS

FIBER OPTIC — FO — PFO

WATER SHUT OFF — WSO

GAS SHUT OFF — GSO

HYDRANT — HYD

MANHOLES

SEWER — MHS

TELEPHONE — MHT

ELECTRICAL — MHE

GAS — MHG

UNKNOWN — U

TRAFFIC SIGNALS / ITS

existing PROPOSED

MAST ARM (existing) — 30' MA (NOTE ANGLE FROM ℄)

OPTICOM RECEIVER

OPTICOM STROBE

TRAFFIC SIGNAL

PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT

SIGNAL CONDUIT — C — PC

CONTROLLER CABINET — cc — CC

METER PEDESTAL — mp — MP

PULL BOX — pb — PB

LOOP DETECTOR (QUADRUPOLE) — (label size)

LOOP DETECTOR (RECTANGULAR) — (label size)

CAMERA POLE (CCTV)

FIBER OPTIC DELINEATOR — fod — FOD

FIBER OPTIC SPLICE VAULT — SVF

ITS EQUIPMENT CABINET — its — ITS

VARIABLE SPEED LIMIT SIGN

DYNAMIC MESSAGE SIGN

ROAD AND WEATHER INFO SYSTEM

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS — B-1

CURB MARK NUMBER - GRANITE — G-1

CLEARING AND GRUBBING AREA — A

DRAINAGE NOTE — 1

EROSION CONTROL NOTE — A

FENCING NOTE — A

GUARDRAIL NOTE — 1

ITS NOTE — 1

LIGHTING NOTE — A

TRAFFIC SIGNAL NOTE — 1

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED	-	DATE	-
NEW DESIGN	RDL	DATE	05/16/18
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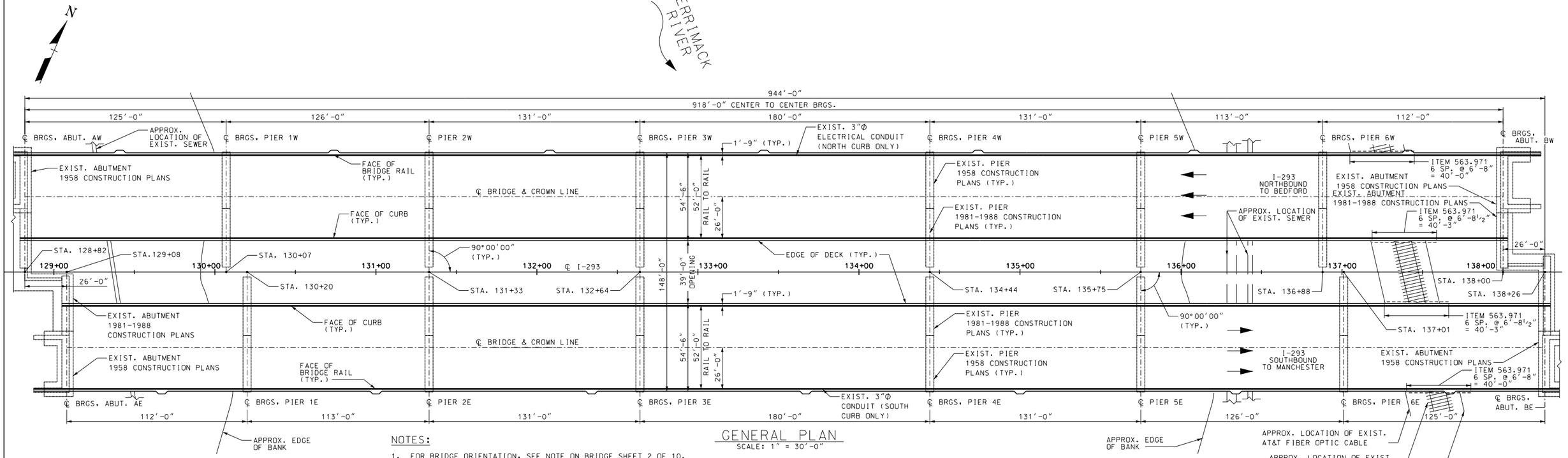
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

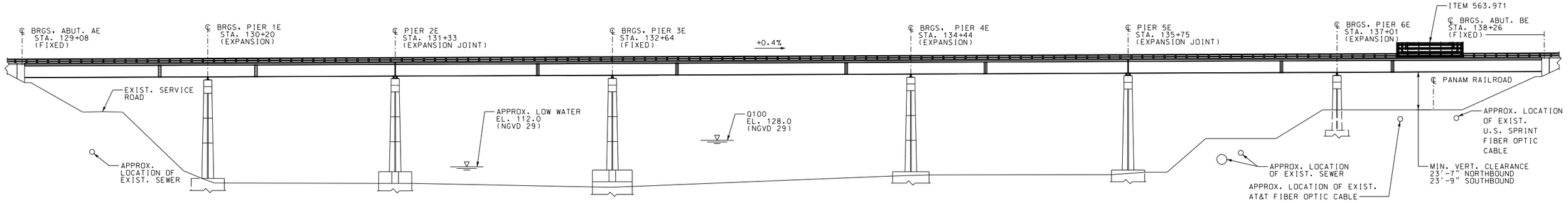
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	40731stdsymb1	40731	4	46



GENERAL PLAN
SCALE: 1" = 30'-0"

NOTES:

1. FOR BRIDGE ORIENTATION, SEE NOTE ON BRIDGE SHEET 2 OF 10.
2. FACE OF BRIDGE RAILING IS 6" FROM FACE OF CURB.
3. LIMITS OF ITEM 563.971 SHALL BE CENTERED OVER EXISTING RAILROAD TRACKS AS DETERMINED IN THE FIELD BY THE CONTRACT ADMINISTRATOR TO THE EXTENTS DIMENSIONED IN THIS SHEET. SEE BRIDGE SHEET 10 OF 10 FOR PROTECTIVE SCREEN DETAILS.



ELEVATION
(SOUTHBOUND SHOWN)
SCALE: 1" = 30'-0"

NOTE:

1. 0100 AND APPROXIMATE LOW WATER ELEVATIONS ARE FROM 1981-1988 CONSTRUCTION PLANS.

INDEX OF BRIDGE SHEETS	
1	GENERAL PLAN AND ELEVATION
2	GENERAL NOTES
3	GENERAL NOTES & QUANTITIES
4	CONSTRUCTION PHASING
5	PIER & DECK REPAIR DETAILS
6	PIER EXPANSION JOINT (1 OF 3)
7	PIER EXPANSION JOINT (2 OF 3)
8	PIER EXPANSION JOINT (3 OF 3)
9	DECK END REINFORCEMENT & BAR SCHEDULE
10	PROTECTIVE SCREEN WITH ALUMINUM RAIL

PS&E PLANS

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

GENERAL PLAN AND ELEVATION

BRIDGE SHEET 1 OF 10

FILE NUMBER 8-1-1

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17
	ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		----------		5	46

PRINTED ON	SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
5/24/2018 AT 11:19:43 AM	BRC\PRELIM	40731GenPlan	AS NOTED

SCOPE OF WORK

BR. NO.199/128 & 199/129

- REMOVE AND REPLACE DECK PAVEMENT AND MEMBRANE.
- REMOVE AND REPLACE EXISTING MODULAR JOINT AT PIERS 2 & 5.
- PATCHING, PARTIAL AND FULL DEPTH CONCRETE BRIDGE DECK REPAIRS AS DIRECTED.
- REPAIR SUBSTRUCTURE CONCRETE AS DIRECTED.

BRIDGE ORIENTATION

THE TWO BRIDGES ARE LABELED I-293 NORTHBOUND AND I-293 SOUTHBOUND CORRESPONDING TO THE PROPOSED ALIGNMENT STATIONING. THIS DESIGNATION DIFFERS FROM EXISTING BRIDGE PLANS. ABUTMENT AND PIER NUMBERING AND LABEL DESIGNATIONS REMAIN CONSISTENT WITH EXISTING BRIDGE PLANS.

MATERIALS AND SPECIFICATIONS

1. SPECIFICATIONS:
   NHDOT 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED
   WELDING PER AASHTO/AWS D1.2015 (INCLUDING ALL REVISIONS
   PUBLISHED BY AASHTO AS OF THE BID OPENING DATE)

2. REINFORCING STEEL:
   AASHTO M31 (ASTM A 615) GRADE 60 EPOXY COATED

3. CONCRETE:
   FULL DEPTH DECK REPAIRS AND DECK RECONSTRUCTION AREAS
   ITEM 520.0201, CONCRETE CLASS AA, ABOVE FOOTINGS
   4,000PSI (AT 28 DAYS)
   PARTIAL DEPTH DECK REPAIRS AND PIER REPAIR AREAS
   ITEM 520.01, CONCRETE CLASS AA
   4,000PSI (AT 28 DAYS)
   ALL CONCRETE SHALL INCLUDE A CORROSION INHIBITOR.

BENCHMARK NOTE

ALL EXISTING DISCS REPRESENTING STATE BENCHMARKS OR SURVEY TRIANGULATION POINTS MUST NOT BE DISTURBED. ALTHOUGH NOT ANTICIPATED, IF THE PROPOSED WORK SHOULD DISTURB ONE OF THESE DISCS, THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR SUFFICIENTLY IN ADVANCE OF THE WORK TO PERMIT THE STATE TO TEMPORARILY RELOCATE THE AFFECTED MARKER.

SURVEY NOTE

PRIOR TO THE REMOVAL OF PAVEMENT ON THE BRIDGE, THE CONTRACTOR SHALL SURVEY THE AREAS AT ALL MODULAR JOINTS TO ESTABLISH THE PROPER ELEVATION OF THE JOINTS. PROPOSED MODULAR JOINTS SHALL BE LOCATED VERTICALLY FLUSH WITH THE PROPOSED PAVEMENT.

TO THE CONTRACTOR

1. THE CONTRACTOR SHOULD BE AWARE THAT EXISTING STRUCTURE DIMENSIONS AND ELEVATIONS SHOWN ON THESE PLANS WERE TAKEN FROM ORIGINAL BRIDGE PLANS AND SUBSEQUENT REHABILITATION PLANS, AND DO NOT NECESSARILY REPRESENT "AS BUILT" DIMENSIONS AND ELEVATIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF THE EXISTING STRUCTURES AND BE PREPARED TO MAKE ANY ADJUSTMENTS REQUIRED TO PROPERLY REHABILITATE THE BRIDGE. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO ADVANCING THE WORK.

2. THE EXISTING PLANS ARE AVAILABLE ON-LINE IN THE BID PACKAGE ON THE INVITATION TO BID WEBPAGE, DURING THE BIDDING PERIOD. AFTER THE CONTRACT HAS BEEN AWARDED A COMPLETE SET OF EXISTING PLANS WILL BE FORWARDED TO THE CONTRACTOR UPON REQUEST. THE FILE NUMBER FOR THIS BRIDGE IS 8-1-1.

REMOVAL NOTES

1. ITEM 502.10X, REMOVAL OF EXISTING BRIDGE STRUCTURE, SHALL INCLUDE THE FULL DEPTH REMOVAL OF THE DECK AND MODULAR JOINTS, INCLUDING IMPACTED RAIL ANCHORAGES, TO THE EXTENTS INDICATED IN THE PLANS.

2. THE CONTRACTOR'S METHOD FOR REMOVAL OF THE EXISTING BRIDGE COMPONENTS SHALL BE SUBMITTED FOR DOCUMENTATION IN ACCORDANCE WITH SECTION 105.02, PRIOR TO COMMENCEMENT OF ANY REMOVAL WORK.

GENERAL CONSTRUCTION NOTES

1. PORTABLE CONCRETE BARRIER, DETOUR SIGNING, AND ALL OTHER TRAFFIC CONTROL MEASURES SHALL BE IN PLACE BEFORE REMOVAL OPERATIONS BEGIN FOR EACH CONSTRUCTION PHASE.

2. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL INTO THE WATERWAY OR ONTO THE RAILROAD TRACKS OR SERVICE ROAD BELOW EXISTING STRUCTURES. ALL COSTS SHALL BE PAID UNDER ITEM 502.10X AND SHALL INCLUDE THE ERECTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURES OR OTHER SUCH METHODS AS APPROVED.

3. THE WELDING OF ATTACHMENTS TO GIRDERS FOR CONSTRUCTION PURPOSES SHALL NOT BE PERMITTED UNLESS APPROVED BY THE NHDOT, BUREAU OF BRIDGE DESIGN.

4. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED $^{3}/_{4}$", UNLESS OTHERWISE NOTED.

5. ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE), SHALL BE APPLIED TO ALL NEW EXPOSED CONCRETE SURFACES AS SHOWN IN THE PLANS OR AS DIRECTED AND TO THE SURFACES OF PIERS 2 AND 5. APPLICATION RATE = 150 SF/GAL.

6. UNLESS OTHERWISE NOTED, HOLES DRILLED INTO EXISTING CONCRETE SHALL BE DRILLED $^{1}/_{2}$" DIAMETER LARGER THAN THE BAR DIAMETER AND GROUTED WITH AN APPROVED HIGH STRENGTH, NON-SHRINK CEMENTITIOUS GROUT. ALL COSTS FOR DRILLING AND GROUTING SHALL BE PAID FOR UNDER ITEM 520.01 OR ITEM 520.0201.

7. APPLY PAVEMENT JOINT ADHESIVE ALONG ALL LONGITUDINAL JOINTS BETWEEN PAVEMENT PASSES AND ALONG BRIDGE CURB LINES PRIOR TO PLACING ALL PAVEMENT COURSES. FOR BRIDGE BASE COURSE APPLY ITEM 403.61, PAVEMENT JOINT ADHESIVE (BRIDGE BASE) AND FOR WEARING COURSE APPLY ITEM 403.6, PAVEMENT JOINT ADHESIVE (ROADWAY ITEM).

8. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL MAKE A RECORD OF THE EXISTING PAINT PAVEMENT MARKINGS. UPON COMPLETION OF THE BRIDGE WORK, THE PAVEMENT MARKINGS SHALL BE REPLACED AS INDICATED IN THE HIGHWAY PLANS.

9. ITEM 403.99, TEMPORARY BITUMINOUS PAVEMENT, SHALL BE PLACED TO TRANSITION FROM THE DECK ARMORING TO THE BASE COURSE ON THE DECK DURING PHASE CONSTRUCTION AS REQUIRED. THE TEMPORARY PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF FINAL ROADWAY WEARING COURSE. (ALL COSTS FOR REMOVAL OF TEMPORARY PAVEMENT SHALL BE SUBSIDIARY TO ITEM 403.99 (ROADWAY ITEM).)

REINFORCEMENT NOTES

1. ALL REINFORCEMENT IN THE DECK SHALL BE EPOXY COATED AND PAID UNDER ITEM 544.2.

2. ALL REINFORCEMENT THAT MAY BE REQUIRED IN THE PIERS SHALL BE BLACK BAR AND PAID UNDER ITEM 544.01.

3. REINFORCEMENT SHALL HAVE $2^{1}/_{2}$" MINIMUM CLEAR COVER UNLESS OTHERWISE NOTED.

4. PLACE REINFORCING STEEL TO AVOID EXPANSION JOINT STEEL.

5. ANY EPOXY COATED BARS THAT ARE FIELD CUT OR CUT TO FIT SHALL BE TOUCHED UP WITH AN APPROVED EPOXY COATING MATERIAL. ALL COSTS SHALL BE INCLUDED IN ITEMS 544.2 AND 544.21.

6. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".

7. EXISTING REINFORCING STEEL THAT IS TO REMAIN IN PLACE WITHIN THE REMOVAL AREAS SHALL BE CUT AS REQUIRED TO PROVIDE $2^{1}/_{2}$" MINIMUM CLEAR COVER FROM THE PROPOSED CONCRETE SURFACES, UNLESS OTHERWISE NOTED. ALL COSTS INCLUDED IN ITEM 502.10X.

SUPERSTRUCTURE REHABILITATION NOTES

1. NO STRUCTURAL REPAIRS ARE ANTICIPATED. STRUCTURAL STEEL SHALL BE INSPECTED FOR STRUCTURAL DEFICIENCIES (e.g. SIGNIFICANT STEEL LOSS, CRACKS, MISSING BOLTS, ETC.) JOINTLY BY THE CONTRACT ADMINISTRATOR AND CONTRACTOR. ANY REPAIRS REQUIRED BY THE DEPARTMENT SHALL BE PERFORMED BY THE CONTRACTOR AND PAID UNDER ITEM 1002.1, REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES.

2. AFTER REMOVAL OF EXISTING PAVEMENT AND MEMBRANE, THE EXISTING CONCRETE BRIDGE DECKS SHALL BE "SOUNDED" TO DETERMINE AREA REQUIRING PARTIAL AND FULL DEPTH DECK REPAIRS. DETERIORATED AREAS SHALL BE REMOVED AND THE REMAINING CONCRETE SURFACES AND EXPOSED REINFORCEMENT CLEANED AS SPECIFIED IN SECTION 511. ALL COSTS TO BE INCLUDED IN ITEM 511.02 OR ITEM 511.03.

3. DETERIORATED AREAS OF DECK REQUIRING FULL DEPTH REPAIR SHALL BE REPAIRED WITH CONCRETE CLASS AA, ABOVE FOOTINGS. DETERIORATED AREAS REQUIRING PARTIAL DEPTH REPAIR SHALL BE REPAIRED WITH CONCRETE CLASS AA. PRIOR TO PLACING NEW CONCRETE, THE AREAS SHALL BE BLAST CLEANED AND PREPARED TO A SATURATED SURFACE DRY CONDITION (ALL COSTS SUBSIDIARY TO ITEMS 520.01 AND 520.0201).

4. DURING ALL REMOVAL AND REPAIR OPERATIONS EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE EXISTING DECK REINFORCEMENT. ANY DAMAGE SHALL BE IMMEDIATELY REPORTED TO THE BUREAU OF BRIDGE DESIGN AND REPAIRED AS DIRECTED, AT THE CONTRACTOR'S EXPENSE.

5. DURING ALL REMOVAL OPERATIONS, EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE TOP FLANGES OF EXISTING GIRDERS. ANY DAMAGE SHALL BE IMMEDIATELY REPORTED TO THE BUREAU OF BRIDGE DESIGN AND REPAIRED AS DIRECTED, AT THE CONTRACTOR'S EXPENSE.

6. TO ACCOMPLISH THE PROPOSED EXPANSION JOINT REPAIRS, THE EXISTING DECK SHALL BE REMOVED TO LIMITS SHOWN IN THE PLANS UNDER ITEM 502.10X, REMOVAL OF EXISTING BRIDGE STRUCTURE. ALL EXPOSED CONCRETE SURFACES OF THE DECK SHALL BE SAWCUT 1" DEEP TO PROVIDE CLEAN REMOVAL LINES (ALL COSTS INCLUDED IN ITEM 502.10X). THE NEW DECK SHALL BE RECONSTRUCTED WITH ITEM 520.0201, CONCRETE CLASS AA, ABOVE FOOTINGS. PRIOR TO PLACING NEW CONCRETE, THE REMOVAL SURFACES SHALL BE BLAST CLEANED AND PREPARED TO A SATURATED SURFACE DRY CONDITION (ALL COSTS INCLUDED IN ITEM 520.0201).

7. ITEM 538.6, BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F) SHALL BE OVERLAPPED PER MANUFACTURER'S REQUIREMENTS. AT DECK ENDS, WHERE THE MEMBRANE WILL NOT OVERLAP NEW OR EXISTING MEMBRANE, A SEALANT/REPAIR MASTIC COMPATIBLE WITH ITEM 538.6 SHALL BRIDGE ANY GAP BETWEEN THE EXISTING MEMBRANE AND NEW MEMBRANE OR BETWEEN THE NEW MEMBRANE AND THE END OF DECK WHEN THERE IS NO EXISTING MEMBRANE. ALL COSTS SHALL BE SUBSIDIARY TO ITEM 538.6.

8. BRIDGE RAIL POST ANCHORAGE ASSEMBLIES WITHIN THE LIMITS OF BRIDGE DECK REMOVAL SHALL BE REPLACED AS INDICATED ON THE PLANS AND SHALL BE PAID UNDER ITEM 563.801, RESETTING BRIDGE RAIL ANCHORAGES. SEE SPECIAL PROVISIONS.

9. ITEM 562.1, SILICONE JOINT SEALANT (F), SHALL BE PLACED AT CURB PLATES AS SHOWN ON THE PLANS. REMOVAL OF ANY EXISTING SEALANT AND CLEANING OF THE JOINT IS SUBSIDIARY TO ITEM 562.1.

10. EXISTING ANCHOR BOLTS SHALL BE REPLACED ONLY IF THEIR CONDITION HAS DETERIORATED, AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR. IF REQUIRED, THIS WORK SHALL BE PAID UNDER ITEM 1002.1.

SUBSTRUCTURE REHABILITATION NOTES

1. EXISTING ABUTMENTS, WINGWALLS, AND PIERS SHALL BE INSPECTED FOR DETERIORATED CONCRETE JOINTLY BY THE CONTRACT ADMINISTRATOR AND CONTRACTOR. ALL DETERIORATED CONCRETE SHALL BE REMOVED. CONCRETE SURFACES OF THE REMOVAL LIMITS SHALL BE SAWCUT TO 1" DEPTH TO PROVIDE CLEAN REMOVAL LINES. ALL INSPECTION, REMOVAL, AND CLEANING SHALL BE AS SPECIFIED IN SECTION 512 AND PAID FOR UNDER ITEM 512.02. NEW CONCRETE PLACED IN THESE AREAS SHALL BE PAID UNDER ITEM 520.01.

2. PRIOR TO PLACING NEW CONCRETE AGAINST EXISTING CONCRETE SURFACES, THE EXISTING CONCRETE SURFACES SHALL BE BLAST CLEANED AND PREPARED TO A SATURATED SURFACE-DRY CONDITION. ALL COSTS SHALL BE SUBSIDIARY TO THE CONCRETE ITEM BEING PLACED.

3. THE TOP SURFACE OF PIER CAPS OF PIERS 2 AND 5 SHALL BE COATED WITH ITEM 536.11, EPOXY COATING FOR CONCRETE.

PEREGRINE FALCON NESTING PLATFORM

1. ON BRIDGE NO. 199/128, A PEREGRINE FALCON NESTING PLATFORM HAS BEEN INSTALLED APPROXIMATELY MIDWAY BETWEEN PIER 3 AND PIER 4, ON TOP OF THE BOTTOM FLANGE ON THE SOUTH SIDE OF THE SECOND GIRDER FROM THE NORTH. THIS PLATFORM SHALL NOT BE DISTURBED DURING THE PRESERVATION WORK. SEE POW FOR ADDITIONAL INFORMATION.

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5/24/2018 AT 11:19:44 AM	BRC\PRELIM	40731BridgeNotes	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

GENERAL NOTES

BRIDGE SHEET: 2 OF 10

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17

FILE NUMBER: 8-1-1

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	----------	6	46

SUMMARY OF BRIDGE QUANTITIES

ITEM NO.	DESCRIPTION	Bridge 199/129 I-293 NB	Bridge 199/128 I-293 SB	QUANTITY	UNIT
403.11902	HBP - MACHINE METHOD, HIGH STRENGTH (QC/QA TIER 2)	1565	1435	3,000	TON
403.6	PAVEMENT JOINT ADHESIVE	10290	9910	20,200	LF
403.61	PAVEMENT JOINT ADHESIVE (BRIDGE BASE)	4858	4858	9,716	LF
403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE	300	300	600	TON
403.99	TEMPORARY BITUMINOUS PAVEMENT	2.5	2.5	5	TON
410.22	ASPHALT EMULSION FOR TACK COAT	1812	1688	3,500	GAL
417	COLD PLANING BITUMINOUS SURFACES	20270	18730	39,000	SY
417.416	RUMBLE STRIPS, 16" WIDE	3270	2390	5,660	LF
417.53	REMOVE AND INLAY EXISTING RUMBLE STRIPS	1076	1824	2,900	LF
502.101	REMOVAL OF EXISTING BRIDGE STRUCTURE	1	—	1	U
502.102	REMOVAL OF EXISTING BRIDGE STRUCTURE	—	1	1	U
511.00	CONCRETE BRIDGE DECK PAVEMENT REMOVAL (F)	5231	5231	10,462	SY
511.02	PREPARATION FOR PARTIAL DEPTH CONCRETE BRIDGE DECK REPAIRS	503	503	1,006	SY
511.03	PREPARATION FOR FULL DEPTH CONCRETE BRIDGE DECK REPAIRS	56	56	112	SY
512.02	PREPARATION FOR CONCRETE REPAIRS, CLASS II	299.5	299.5	599	SY
520.01	CONCRETE CLASS AA	116.5	116.5	233	CY
520.0201	CONCRETE CLASS AA, ABOVE FOOTINGS	55	55	110	CY
534.3	WATER REPELLENT (SILANE/SILOXANE)	84	84	168	GAL
536.11	EPOXY COATING FOR CONCRETE (F)	727	727	1,454	SF
538.6	BARRIER MEMBRANE, HEAT WELDED - MACHINE METHOD (F)	5436	5436	10,872	SY
540.511	GALVANIC CORROSION PROTECTION SYSTEM (DISTRIBUTED ANODES)	218	218	436	LF
540.512	GALVANIC CORROSION PROTECTION SYSTEM (DISCRETE ANODES)	1736.5	1736.5	3,473	EA
544.01	REINFORCING STEEL	250	250	500	LB
544.2	REINFORCING STEEL, EPOXY COATED (F)	4166	4166	8,332	LB
544.21	REINFORCING STEEL, EPOXY COATED, MECHANICAL CONNECTORS (F)	468	468	936	LB
561.2001	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)	109	—	109	LF
561.2002	PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F)	—	109	109	LF
562.1	SILICONE JOINT SEALANT (F)	7	7	14	LF
563.001	BRIDGE RAIL ANCHORAGE	8	8	16	EA
563.94	PROTECTIVE SCREENING FOR OVERPASS STRUCTURES	81	81	162	LF
609.55	RESET GRANITE CURB (BRIDGE)	29	29	58	LF
628.2	SAWED BITUMINOUS PAVEMENT	1850	1850	3,700	LF
698.12	FIELD OFFICE TYPE B	9	9	18	MON
1002.1	REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES	*	*	*	$
1010.15	FUEL ADJUSTMENT	*	*	*	$
1010.2	ASPHALT CEMENT ADJUSTMENT	*	*	*	$
1010.3	QUALITY CONTROL QUALITY ASSURANCE (QC/QA) ASPHALT	*	*	*	$
1010.5	COMPLETION INCENTIVE/ DISINCENTIVE	*	*	*	$
	* NOT A BID ITEM				

SUMMARY OF CCTV QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
614.331	3" STEEL CONDUIT	25	LF
614.523	MOLDED PULL BOX 17"X30"	2	EA
614.73114	3" PVC CONDUIT, SCHEDULE 40	105	LF
677.41001	CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM FOUNDATION	1	U
677.4101	CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM	1	U
677.54101	GROUND MOUNTED ITS EQUIPMENT CABINET	1	U
677.5822	1 GBPS FIBER ETHERNET SWITCH	1	EA
677.6301	METER AND DISCONNECT PEDESTAL	1	U
677.64	UNINTERRUPTIBLE POWER SUPPLY (UPS)	1	EA
677.9308	3-CONDUCTOR #8 AWG CABLE	45	LF

PERMANENT CONSTRUCTION SIGNS AND WARNING DEVICES
(INCLUDED IN ITEM NO. 619.1)

SIGN NO.	DESCRIPTION	SIZE (ft)	S.F.	NO. REQ.	TOTAL AREA	POSTS	PORTABLE SIGN SUPPORTS	REMARKS
G20-2a	END ROAD WORK	2X4	8	4	32	8		ORANGE/BLACK
W20-1a	BRIDGE WORK AHEAD	4x4	16	2	32	4		FLUORESCENT ORANGE/BLACK
W20-1e	BRIDGE WORK 1/2 MILE	4x4	16	6	96	12		FLUORESCENT ORANGE/BLACK
W20-1f	BRIDGE WORK 1 MILE	4x4	16	6	96	12		FLUORESCENT ORANGE/BLACK
R50-1	NH LAW WORK ZONE	6x4	24	6	144	12		BLACK/WHITE

The estimated quantities of "Permanent Controls" are hereby listed. The Contractor is responsible for all "Operational Controls" required under section 619 of the NHDOT Specifications and the Manual on Uniform Traffic Control Devices (MUTCD), Part VI.

SUMMARY OF ROADWAY QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
203.5525	PORTABLE CHANGEABLE MESSAGE SIGN PLATFORM	4	U
203.55261	INSTALLATION AND REMOVAL OF SWZ-PORTABLE QUEUE TRAILER PLATFORM	4	U
203.55262	INSTALLATION AND REMOVAL OF SWZ-PCMS PLATFORM	1	U
203.55264	INSTALLATION AND REMOVAL OF SWZ-MOBILE VIDEO TRAILER PLATFORM	1	U
403.12	HOT BITUMINOUS PAVEMENT, HAND METHOD	10	TON
604.0007	POLYETHYLENE LINER	1	EA
604.124	CATCH BASINS TYPE B, 4-FOOT DIAMETER	1	U
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	640	LF
606.41741	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE)	3,160	LF
606.91	RESETTING OR SETTING GUARDRAIL	25	LF
606.9513	TEMP. IMPACT ATTENUATION DEVICE (REDIRECTIVE), TEST LEVEL 3	2	U
609.5	RESET GRANITE CURB	25	LF
615.03201	TRAFFIC SIGN TYPE C, BREAKAWAY MOUNTS	6.25	SF
615.0501	TRAFFIC SIGN TYPE BB	25	SF
615.0501	TRAFFIC SIGN TYPE CC	29	SF
616.191	ALTERATIONS TO TRAFFIC SIGNALS	1	U
618.61	UNIFORMED OFFICERS WITH VEHICLE	*	$
619.1	MAINTENANCE OF TRAFFIC	1	U
619.25	PORTABLE CHANGEABLE MESSAGE SIGN	8	U
619.279	AUTOMATED TRAILER-MOUNTED SPEED LIMIT SIGN	4	U
619.503	WORK ZONE ITS OPERATIONAL COSTS (SUMMER)	10	MON
619.51	PORTABLE QUEUE TRAILER/SENSOR (PQT)	80	MON
619.52	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)	25	MON
619.54	MOBILE VIDEO TRAILER WITH PAN TILT ZOOM (PTZ)	20	MON
619.91	RELOCATE WORK ZONE ITS DEVICE	5	U
632.0104	RETROREFLECTIVE PAINT PAVE. MARKING, 4" LINE	300	LF
632.0106	RETROREFLECTIVE PAINT PAVE. MARKING, 6" LINE	33,500	LF
632.1106	PREFORMED RETROREFLECTIVE TAPE, TYPE I (REMOVABLE) 6" LINE	15,450	LF
632.3106	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 6" LINE	150	LF
632.3112	RETROREFLECT. THERMOPLAS. PAVE. MARKING, 12" LINE	3,900	LF
632.32	RETROREFLECT. THERMOPLAS. PAVEMENT MARKING, SYMBOL OR WORD	160	SF
632.911	OBLITERATE PAVE. MARKING LINE, 12" WIDE & UNDER	15,550	LF
632.92	OBLITERATE PAVEMENT MARKING, SYMBOL OR WORD	60	SF
645.531	SILT FENCE	200	LF
646.31	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS	125	SY
647.1	HUMUS	15	CY
670.104	TEMPORARY PORTABLE LIGHTING	2	U
692	MOBILIZATION	1	U
693	ON-THE-JOB TRAINING OF UNSKILLED WORKERS	*	$
697.41	CRITICAL PATH METHOD (CPM) ELECTRONIC SCHEDULE	1	U
699	MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL	*	$
1008.22	ALTERATIONS AND ADDITIONS AS NEEDED - TRAFFIC SIGNALS	*	$
	* NOT A BID ITEM		

ITS DEVICES, PULL BOX, AND CONDUIT SCHEDULE

	REFERENCE ITEM NUMBERS		614.331	614.523	614.73114	677.41001	677.4101		677.54101	677.5822	677.6301	677.64	677.9308	
ITS REFERENCE ID	APPROX. STATION	REFERENCE LINE FOR CONDUIT RUN	3" STEEL CONDUIT	MOLDED PULL BOX 17"X30"	3" PVC CONDUIT SCHEDULE 40	CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM FOUNDATION	CCTV SYSTEM	CAT. 6 CABLE FOR POWER OVER ETHERNET (POE)	GROUND MOUNTED ITS EQUIPMENT CABINET	1 GBPS FIBER ETHERNET SWITCH	METER AND DISCONNECT PEDESTAL	UNINTERRUPTIBLE POWER SUPPLY (UPS)	3-CONDUCTOR #8 AWG CABLE	REMARKS
			LF	EA	LF	U	U	LF (est.) **	U	EA	U	EA	LF	
	101-E-X-53.8-CCTV-X-5													
50	STA 387+50, 45' RT	-				1	1	65						CCTV POLE 101-E-X-53.8-CCTV-X-5
51	STA 387+40, 45' RT	50 - 51		1	10			15						MOLDED PULLBOX FOR COMMUNICATIONS
52	STA 387+25, 73' RT	51 - 52		1	50			60						MOLDED PULLBOX FOR COMMUNICATIONS
53	STA 387+25, 105' RT	52 - 53			5			10	1	1		1		GROUND MOUNTED ITS EQUIPMENT CABINET WITH CELLULAR MODEM
54	STA 387+14, 120' RT	53 - 54			20						1		42	METER AND DISCONNECT PEDESTAL
55	STA 386+94, 105' RT	54 - 55	25		20									POWER SERVICE POLE (EVERSOURCE)
	SUBTOTAL		**25**	**2**	**105**	**1**	**1**	150	**1**	**1**	**1**	**1**	**42**	
	ROUNDING		**0**	**0**	**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	**3**	
	TOTAL		**25**	**2**	**105**	**1**	**1**	150	**1**	**1**	**1**	**1**	**45**	

* NOT AN ITEM TOTAL
** COLUMNS WITH (est.) REPRESENT ELEMENTS OF THE UNIT ITEM AND ARE NOT PAID SEPARATELY.

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

GENERAL NOTES & QUANTITIES

BRIDGE SHEET 3 OF 10

FILE NUMBER 8-1-1

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17

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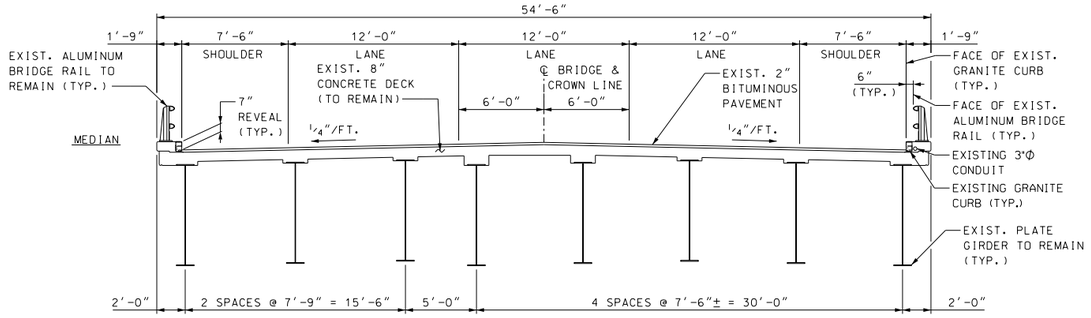
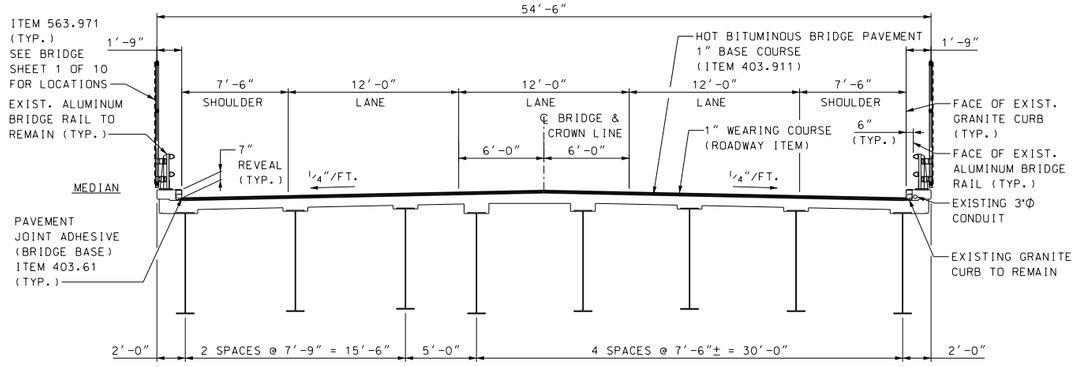
5/24/2018 AT 1:05:09 PM	BRC\PRELIM	40731Qty	AS NOTED

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		----------	7	46



EXISTING CROSS SECTION

(SOUTHBOUND BRIDGE - LOOKING EAST)
SCALE: 3/16" = 1'-0"



PROPOSED CROSS SECTION

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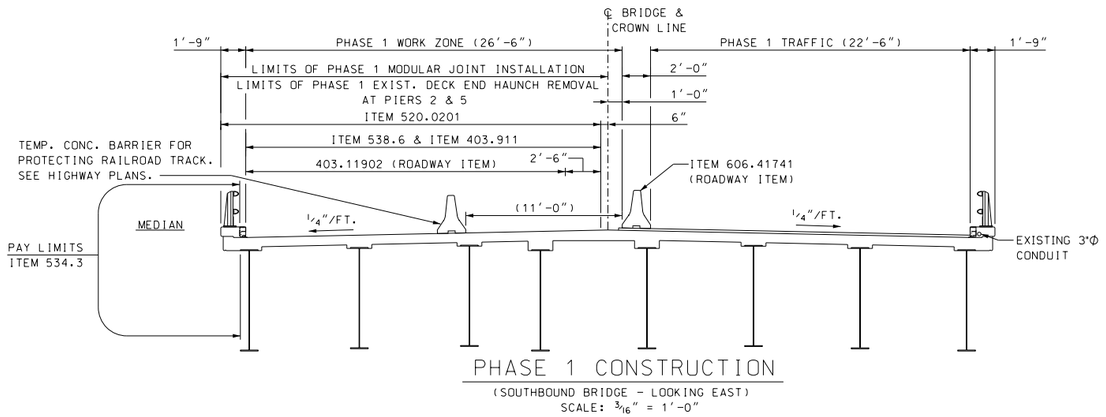

PHASE 1 CONSTRUCTION

(SOUTHBOUND BRIDGE - LOOKING EAST)
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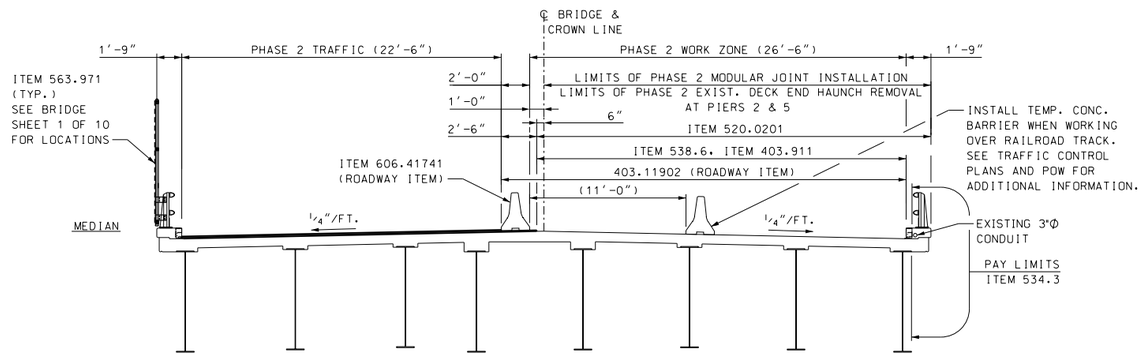

PHASE 2 CONSTRUCTION

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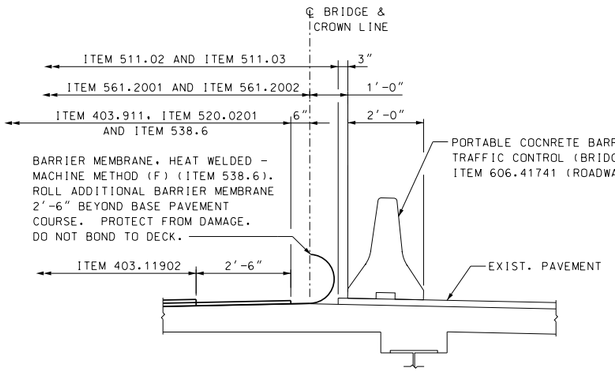

PHASE 1 PAVEMENT AND MEMBRANE DETAIL

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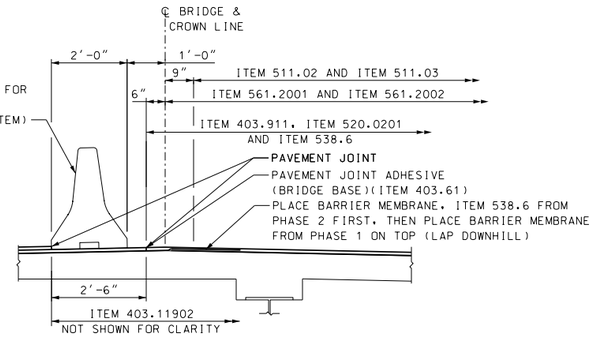

PHASE 2 PAVEMENT AND MEMBRANE DETAIL

SCALE: 1/2" = 1'-0"

PHASE CONSTRUCTION NOTES:

GENERAL:

1. CONSTRUCTION NOTES AND PHASING SECTIONS FOR SOUTHBOUND BRIDGE SHOWN, NORTHBOUND BRIDGE SIMILAR, BUT LOOKING WEST, EXCEPT AS NOTED.
2. ALL CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), APPROVED NHDOT TRAFFIC CONTROL PROCEDURES, AND IN ACCORDANCE WITH THE TRAFFIC CONTROL PLAN. PHASING NUMBERS INDICATED CORRESPOND TO HIGHWAY TCP NUMBERING. SEE ROADWAY PLANS AND TRAFFIC CONTROL PLANS.
3. STRIP SEALS MUST BE PLACED AS SINGLE UNITS (NO SPLICING).

PHASE 1:

1. REMOVE AND INLAY EXISTING RUMBLE STRIPS WITHIN THE PROJECT LIMITS.
2. PLACE PHASE 1 TRAFFIC SIGNS AND TEMPORARY STRIPING.
3. PLACE PORTABLE TRAFFIC BARRIER AS SHOWN ON THE PLANS.
4. GRIND EXISTING LANE MARKINGS, PAINT LANES IN PHASE 1 TRAFFIC SECTION. SHIFT TRAFFIC TO THE SOUTH SIDE OF THE BRIDGE.
5. IN THE WORK ZONE, REMOVE EXISTING BRIDGE PAVEMENT AND BARRIER MEMBRANE, REMOVE GRANITE CURB AND DECK TO LIMITS SHOWN, REMOVE EXISTING MODULAR JOINT, INSTALL NEW MODULAR JOINT, REPAIR DECK CONCRETE AS REQUIRED, REPAIR BRIDGE RAIL AS REQUIRED, PLACE BARRIER MEMBRANE, PAVE NORTH SIDE OF BRIDGE WITH 1" BASE COURSE AND 1" FINAL COURSE TO LIMITS SHOWN, AND TAPE TEMPORARY LANES.

PHASE 2:

1. PLACE PHASE 2 TRAFFIC SIGNS AND TEMPORARY STRIPING.
2. MOVE PORTABLE CONCRETE TRAFFIC BARRIER AS SHOWN ON THE PLANS.
3. SHIFT TRAFFIC TO THE NORTH SIDE OF THE BRIDGE.
4. IN THE WORK ZONE, REMOVE LANE TAPE, REMOVE EXISTING BRIDGE PAVEMENT AND BARRIER MEMBRANE, REMOVE GRANITE CURB AND DECK TO LIMITS SHOWN, REMOVE EXISTING MODULAR JOINT, INSTALL NEW MODULAR JOINT, REPAIR DECK CONCRETE AS REQUIRED, REPAIR BRIDGE RAIL AS REQUIRED, PLACE BARRIER MEMBRANE AND PAVE SOUTH SIDE OF BRIDGE WITH 1" BASE COURSE.
5. REMOVE TEMPORARY TRAFFIC BARRIER.
6. PAVE SOUTH SIDE OF BRIDGE WITH 1" FINAL COURSE TO LIMITS SHOWN.
7. PAINT PERMANENT LANE LINES, REMOVE TRAFFIC SIGNS, AND TEMPORARY STRIPING.
8. OPEN BRIDGE TO FULL WIDTH TRAFFIC.

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Engineering & Construction Services

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5/24/2018 AT 11:20:28 AM	BRC\PRELIM	40731Phases	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

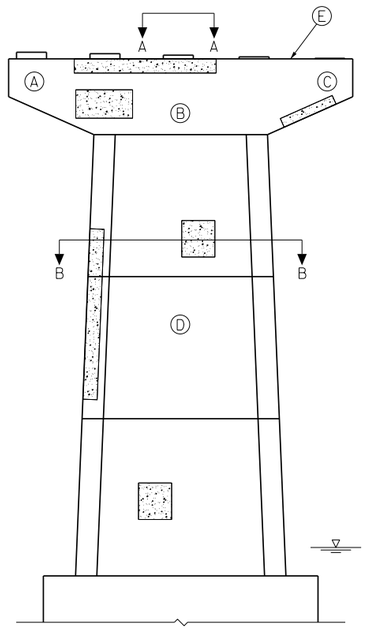
LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

CONSTRUCTION PHASING

BRIDGE SHEET 4 OF 10

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17
	ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		----------		8	46

FILE NUMBER 8-1-1



TYPICAL EXISTING PIER ELEVATION

SCALE: 1/8" = 1'-0"

EXISTING PIER REHABILITATION

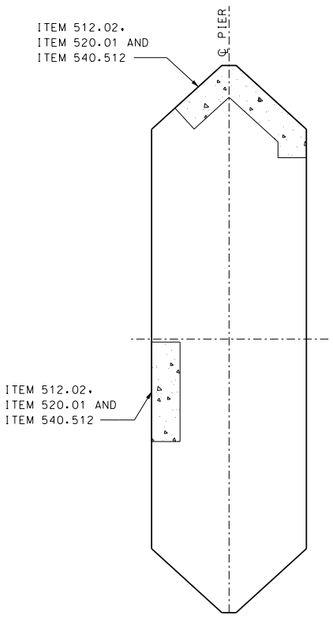
LOCATION	PIER 2		PIER 5	
	NORTHBOUND	SOUTHBOUND	NORTHBOUND	SOUTHBOUND
Ⓐ	CRACKS HOLLOW SOUNDING AREAS	SPALLED EXPOSED REBAR HOLLOW SOUNDING AREAS	HOLLOW SOUNDING AREAS	DELAMINATION HOLLOW SOUNDING AREAS CRACKING
Ⓑ	HOLLOW SOUNDING AREA	CRACKING	HOLLOW SOUNDING AREAS	
Ⓒ	HOLLOW SOUNDING AREA	SPALLED HOLLOW SOUNDING AREAS EXPOSED REBAR	HOLLOW SOUNDING AREAS	DELAMINATION HOLLOW SOUNDING AREAS CRACKING
Ⓓ	CRACKS HOLLOW SOUNDING AREAS	SPALLED EXPOSED REBAR CRACKING	SPALLED HOLLOW SOUNDING AREAS CRACKING	EXPOSED REBAR CRACKS
Ⓔ	SPALLED BEARING UNDERMINED	SPALLED EXPOSED REBAR HOLLOW SOUNDING AREAS CRACKING		BEARING UNDERMINDED HOLLOW SOUNDING AREAS CRACKING

PIER REPAIR NOTES:

1. THE REHABILITATION TABLE PROVIDED INDICATES THE GENERAL SCOPE OF MAJOR REPAIR WORK REQUIRED. OTHER AREAS OF THE SUBSTRUCTURE MAY REQUIRE REPAIR WORK AT THE DIRECTION OF THE ENGINEER.
2. ALL PIER AND ABUTMENT SURFACES ARE TO BE VISUALLY EXAMINED AND TESTED BY SOUNDING WITH A HAMMER TO DETECT HIDDEN DETERIORATION. ALL ACCESS FOR INSPECTION AND ALL SOUNDING TO BE PROVIDED BY THE CONTRACTOR AND PAID UNDER ITEM 512.02. INSPECTION TO BE DIRECTED AND WITNESSED BY THE ENGINEER.
3. THE AREA OF EXPLORATION AND THE LIMITS OF REMOVAL OF ALL THE DETERIORATED CONCRETE SHALL BE DIRECTED BY THE ENGINEER. THE MINIMUM DEPTH OF CONCRETE REMOVAL FOR DETERIORATED CONCRETE SHALL BE A MINIMUM OF 1 1/2" BEHIND EXISTING REINFORCING STEEL.
4. THE SURFACE IS TO BE PREPARED IN SUCH A MANNER AS TO AVOID FEATHERED EDGES AND THE BOUNDARIES OF THE AREAS TO BE REPAIRED ARE TO BE SQUARE CUT OR SLIGHTLY UNDER CUT.
5. WHERE REINFORCING STEEL IS EXPOSED ORIGINALLY OR AFTER CHIPPING, IT IS TO BE THOROUGHLY CLEANED OF SCALE, RUST, CONCRETE OR OTHER INJURIOUS COATING.
6. PREPARATION FOR CONCRETE REPAIRS, ITEM 512.02, IS TO INCLUDE THE REMOVAL OF DETERIORATED CONCRETE FROM, AND CLEANING OF SOUND CONCRETE ON THE FOLLOWING AREAS:

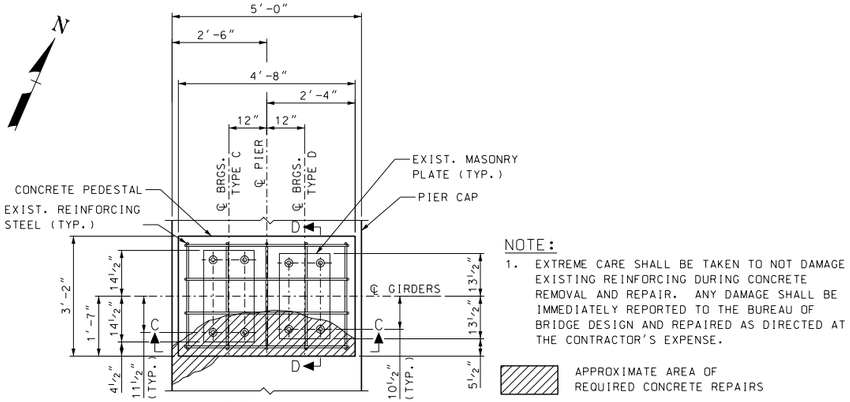
   ABUTMENTS – EXISTING BACKWALLS, WINGS, BRIDGE SEATS AND EXPOSED FRONT FACES BELOW THE BRIDGE SEATS AS DIRECTED BY THE ENGINEER.

   PIERS – EXISTING HAMMERHEADS INCLUDING BRIDGE SEATS AND SHAFTS TO LOW WATER AS DIRECTED BY THE ENGINEER.
7. PRIOR TO PLACING NEW CONCRETE, THE SURFACES WHERE EXISTING CONCRETE HAS BEEN REMOVED SHALL BE BLAST CLEANED AND PREPARED TO A SATURATED SURFACE-DRY CONDITION. ALL COST SHALL BE SUBSIDIARY TO THE CONCRETE ITEM BEING PLACED.
8. COAT ALL EXISTING VERTICAL SURFACES OF PIERS 2 AND 5 ABOVE LOW WATER, AND ANY REPAIRED AREAS ON OTHER SUBSTRUCTURE COMPONENTS, AS DIRECTED BY THE ENGINEER, WITH ITEM 534.3 WATER REPELLENT (SILANE-SILOXANE).



SECTION B-B

SCALE: 3/8" = 1'-0"



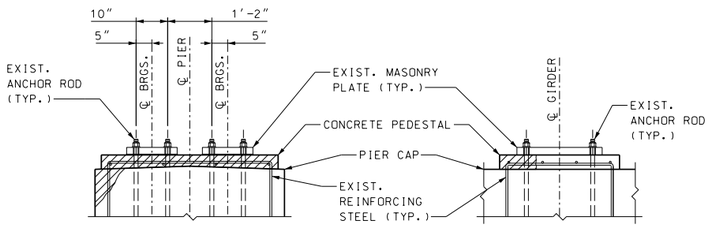
VIEW A-A

SCALE: 1/2" = 1'-0"

NOTE:

1. EXTREME CARE SHALL BE TAKEN TO NOT DAMAGE EXISTING REINFORCING DURING CONCRETE REMOVAL AND REPAIR. ANY DAMAGE SHALL BE IMMEDIATELY REPORTED TO THE BUREAU OF BRIDGE DESIGN AND REPAIRED AS DIRECTED AT THE CONTRACTOR'S EXPENSE.

APPROXIMATE AREA OF REQUIRED CONCRETE REPAIRS

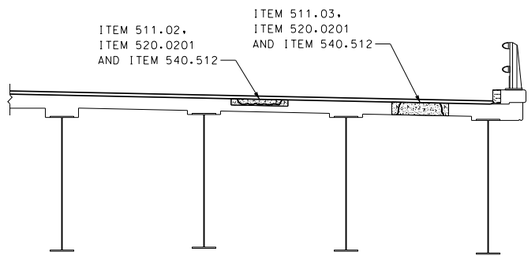


SECTION C-C

SCALE: 1/2" = 1'-0"

SECTION D-D

SCALE: 1/2" = 1'-0"



TYPICAL DECK REPAIR DETAIL

SCALE: 1/4" = 1'-0"

DECK CONCRETE REPAIR NOTES:

1. CONCRETE WILL BE REPAIRED IN PHASES. SEE CONSTRUCTION PHASING SHEET.

CONCRETE REPAIRS

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STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PIER & DECK REPAIR DETAILS

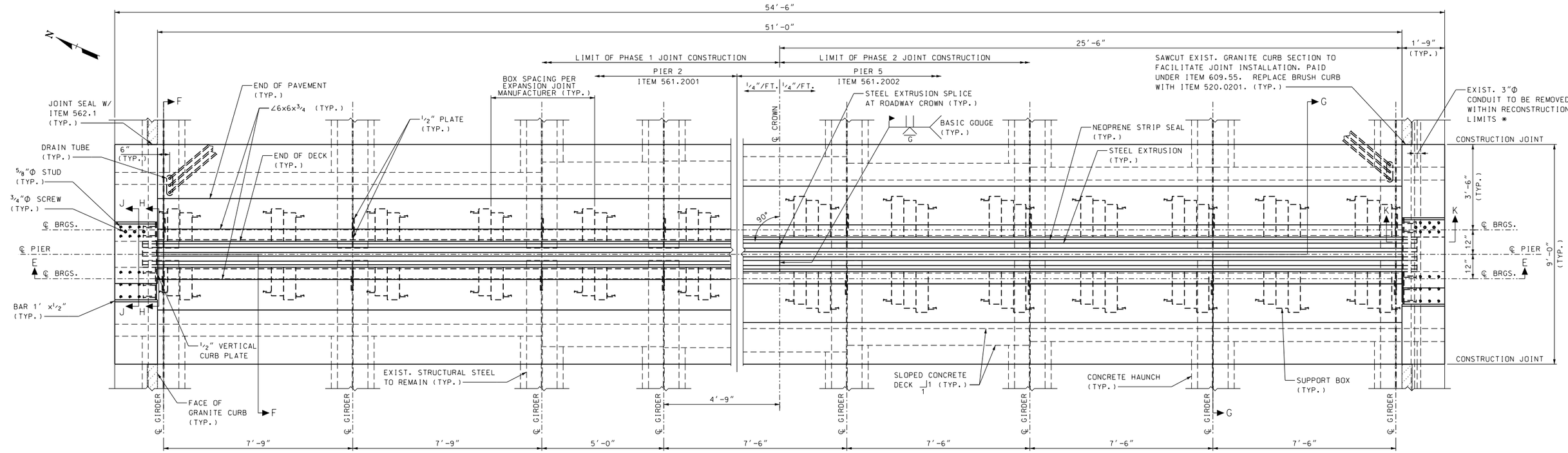
BRIDGE SHEET 5 OF 10

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17
	ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	
	REV. DATE		----------		9	

FILE NUMBER 8-1-1

TOTAL SHEETS 46

PRINTED ON	SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
5/24/2018 AT 11:20:30 AM	BRC\PRELIM	40731PierDeckRepair	AS NOTED



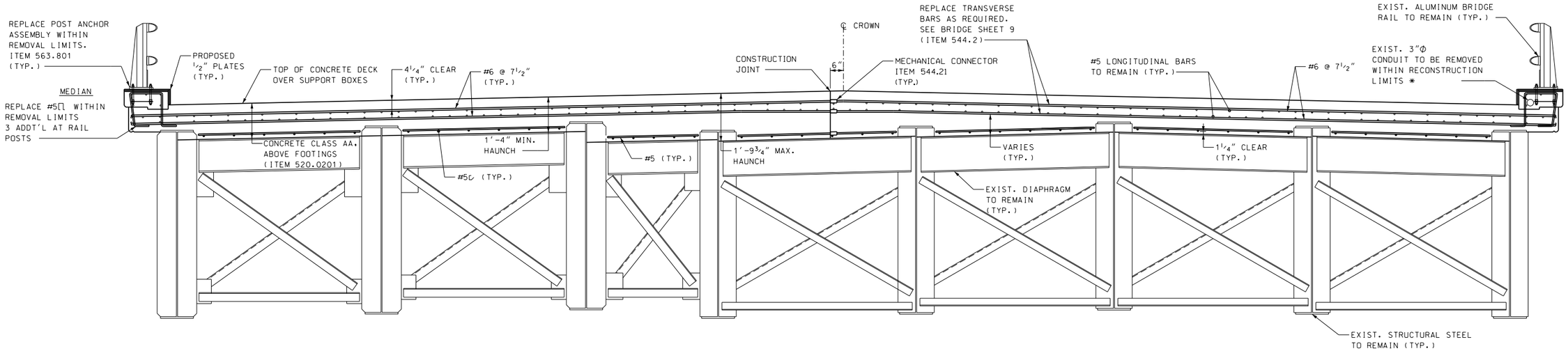
NOTE:

1. BOTH PIER 2 & 5 GEOMETRY ARE SHOWN IN THIS PLAN VIEW.

PLAN VIEW

(SOUTHBOUND BRIDGE - NORTHBOUND SIMILAR)
SCALE: 1/2" = 1'-0"

* CAP ENDS OF CONDUIT OUTSIDE OF RECONSTRUCTION LIMITS. COST SUBSIDIARY TO S61.200X.



NOTE:

1. EXPANSION JOINT & SUPPORT BOXES NOT SHOWN FOR CLARITY.

SECTION E-E (PIER 2 & 5)

(SOUTHBOUND BRIDGE - NORTHBOUND SIMILAR)
SCALE: 1/2" = 1'-0"

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TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PIER EXPANSION JOINT (1 OF 3)

BRIDGE SHEET: 6 OF 10

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17

FILE NUMBER: 8-1-1

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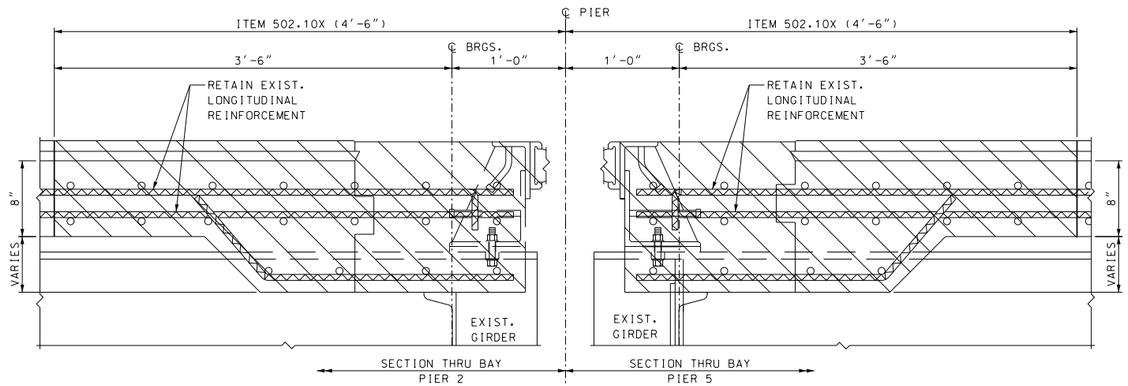
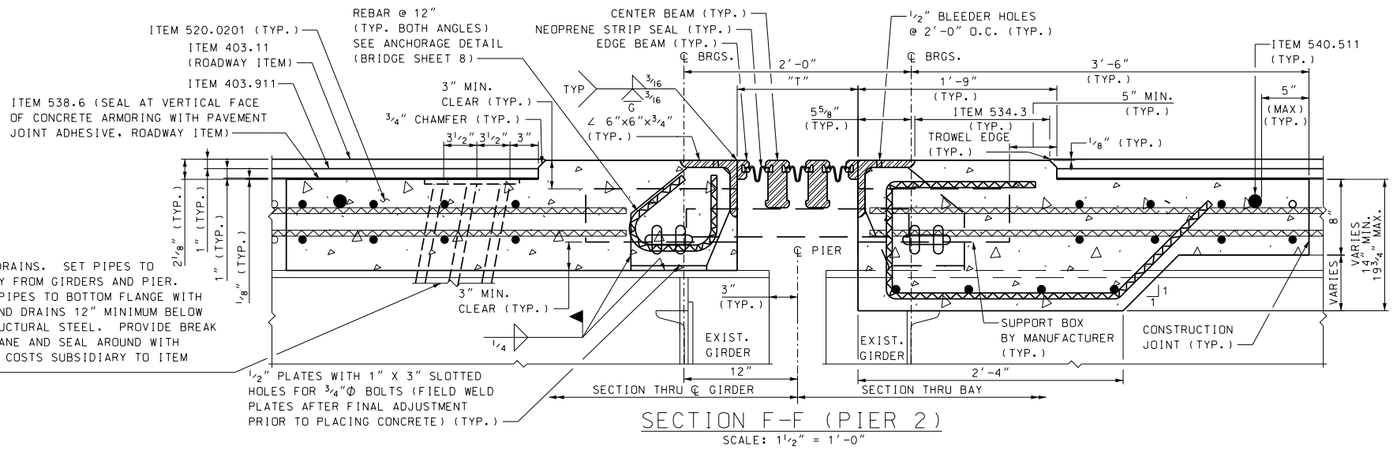
ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE		----------	10	46



EXISTING MODULAR JOINT REMOVAL

SCALE: 1½" = 1'-0"

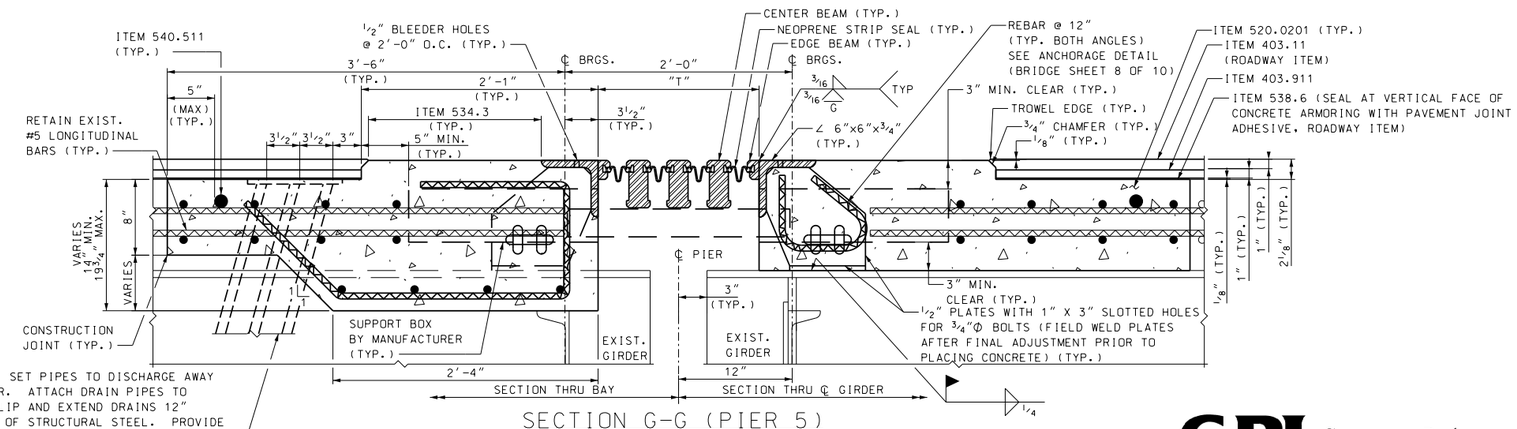


3 - 1"Φ PVC DRAINS. SET PIPES TO DISCHARGE AWAY FROM GIRDERS AND PIER. ATTACH DRAIN PIPES TO BOTTOM FLANGE WITH CLIP AND EXTEND DRAINS 12" MINIMUM BELOW BOTTOM OF STRUCTURAL STEEL. PROVIDE BREAK THROUGH MEMBRANE AND SEAL AROUND WITH ASPHALT. ALL COSTS SUBSIDIARY TO ITEM 520.0201.

½" PLATES WITH 1" X 3" SLOTTED HOLES FOR ¾"Φ BOLTS (FIELD WELD PLATES AFTER FINAL ADJUSTMENT PRIOR TO PLACING CONCRETE) (TYP.)

SECTION F-F (PIER 2)

SCALE: 1½" = 1'-0"



3 - 1"Φ PVC DRAINS. SET PIPES TO DISCHARGE AWAY FROM GIRDERS AND PIER. ATTACH DRAIN PIPES TO BOTTOM FLANGE WITH CLIP AND EXTEND DRAINS 12" MINIMUM BELOW BOTTOM OF STRUCTURAL STEEL. PROVIDE BREAK THROUGH MEMBRANE AND SEAL AROUND WITH ASPHALT. ALL COSTS SUBSIDIARY TO ITEM 520.0201.

SECTION G-G (PIER 5)

SCALE: 1½" = 1'-0"

EXPANSION JOINT NOTES

1. THE MODULAR JOINT SHOWN IS REPRESENTATIVE OF THE TYPE OF EXPANSION JOINT ACCEPTABLE FOR USE. THE EXACT JOINT CONFIGURATION WILL DEPEND UPON THE MANUFACTURER'S DETAILS. SHOP DRAWINGS OF MODULAR EXPANSION JOINT SYSTEM INCLUDING CURB DETAILS, PLACEMENT DETAILS, AND SHIPPING DEVICES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE ENTIRE ASSEMBLY, INCLUDING NEOPRENE SEALS, SHALL BE PAID FOR AS ITEM 561.2001 AND 561.2002, PREFABRICATED MODULAR BRIDGE JOINT SYSTEM (F).
2. EXPANSION JOINT STEEL SHALL BE AASHTO M223 (ASTM A572) GRADE 50. THE MINOR STEEL PLATES AND EXTRUSIONS MAY CONFORM TO AASHTO M183 (ASTM A36). ALL STEEL SHALL BE GALVANIZED.
3. SPLICES FOR EXPANSION JOINT STEEL SHALL DEVELOP FULL STRENGTH.
4. NEOPRENE SEALS SHALL BE FURNISHED IN ONE CONTINUOUS LENGTH AT EACH JOINT. NO SPLICES WILL BE ALLOWED.
5. THE EXPANSION JOINT MANUFACTURER SHALL INCLUDE A TEMPERATURE SETTING TABLE FOR THE EXPANSION JOINT LOCATION ON THE SHOP DRAWINGS.
6. MINIMUM INSTALLATION WIDTH "T" = 12¾" AT 65°F FOR PIER 2, AND "T" = 17" AT 65°F FOR PIER 5. ADJUSTMENTS IN OPENING FOR A 15°F CHANGE IN TEMPERATURE CAN BE FOUND IN THE ADJUSTMENT TABLE ON THIS SHEET.
7. THE MODULAR BRIDGE JOINT SYSTEM SHALL HAVE A FACTORED RANGE OF MOVEMENT OF 4.46" FOR PIER 2. THIS DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE AND MINIMUM INSTALLATION.
8. THE MODULAR BRIDGE JOINT SYSTEM SHALL HAVE A FACTORED RANGE OF MOVEMENT OF 6.28" FOR PIER 5. THIS DESIGN INCLUDES MOVEMENT DUE TO TEMPERATURE AND MINIMUM INSTALLATION.
9. THE CONTRACTOR SHALL USE MODULAR BRIDGE JOINT SYSTEM STEM SERIES BY WATSON BOWMAN ACME OR STEEL FLEX MODULAR D SERIES BY D.S. BROWN.
10. JOINT SUPPORT PLATES AND HARDWARE SHALL BE SHOP WELDED TO THE EXPANSION JOINT STEEL AND SHALL BE DETAILED TO ALLOW FOR NECESSARY ADJUSTMENTS TO ACCOMMODATE ROADWAY CROSS SLOPE, GRADE, AND TEMPERATURE SETTINGS.
11. SUPPORT BOXES AND BARS SHALL BE DESIGNED BY THE MANUFACTURER UTILIZING MULTIPLE SUPPORT BAR SYSTEMS AND FULL-PENETRATION WELDED CONNECTION BETWEEN THE CENTER BEAMS AND SUPPORT BARS. NO SINGLE-SUPPORT BAR WITH A YOKE (STIRRUP) WILL BE ALLOWED. TYPE, SIZE, AND LOCATION SHALL BE DETERMINED BY THE MANUFACTURER.
12. STIFFENER PLATES, STUDS, AND ANCHORAGES MAY NEED TO BE SHIFTED FROM THE LAYOUT AS SHOWN ON THESE PLANS BASED ON THE MANUFACTURER'S DESIGN OF THE SUPPORT BOXES AND BARS.
13. PROTECT THE TOP OF THE EXPANSION JOINT DURING PLACEMENT OF CONCRETE AND BITUMINOUS PAVEMENT.
14. NO "LOW PROFILE" STEEL EXTRUSIONS SHALL BE ALLOWED.
15. NO REINFORCING STEEL SHALL BE CUT TO CLEAR THE BRIDGE EXPANSION DEVICE WITHOUT PRIOR APPROVAL OF THE ENGINEER.
16. IMMEDIATELY AFTER THE JOINT HAS BEEN SECURED TO THE STRUCTURAL STEEL, REMOVE SHIPPING DEVICES AND GRIND SMOOTH ANY WELDS ON EXPOSED SURFACES. REPAIR ANY DAMAGE TO GALVANIZED SURFACES PER SECTION 550.

"T" PROPOSED JOINT SPACING ADJUSTMENT TABLE

TEMPERATURE	PIER 2W	PIER 2E	PIER 5W	PIER 5E
20°F	14 1/16"	14"	18 7/8"	19"
35°F	13 5/8"	13 9/16"	18 1/4"	18 5/16"
50°F	13 3/16"	13 3/16"	17 5/8"	17 11/16"
65°F	12 3/4"	12 3/4"	17"	17"
80°F	12 5/16"	12 5/16"	16 3/8"	16 5/16"
95°F	11 7/8"	11 15/16"	15 3/4"	15 11/16"

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TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PIER EXPANSION JOINT (2 OF 3)

BRIDGE SHEET 7 OF 10

FILE NUMBER 8-1-1

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
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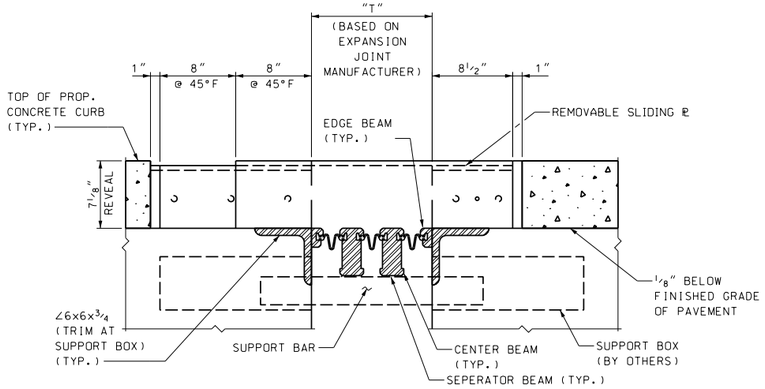
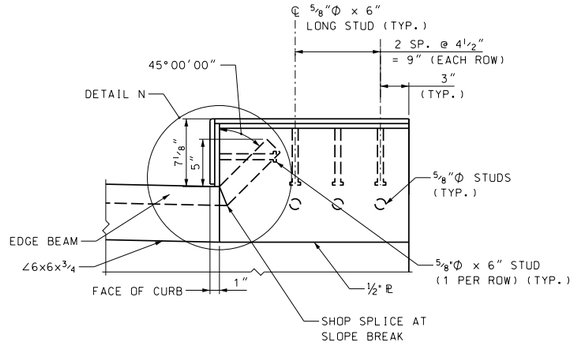


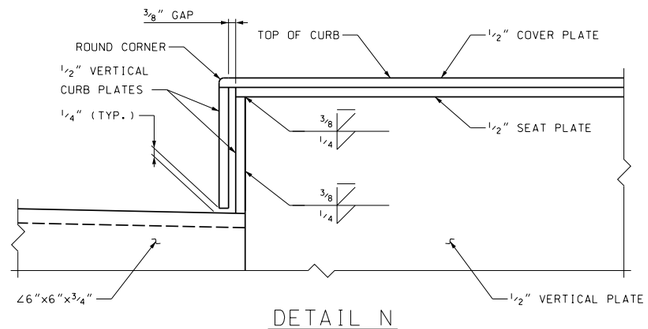
VIEW H-H

SCALE: 1½" = 1'-0"



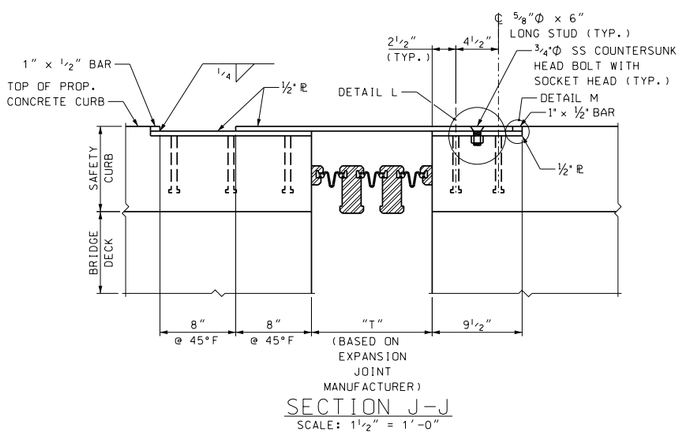
SECTION K-K

SCALE: 1½" = 1'-0"



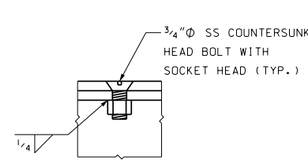
DETAIL N

NOT TO SCALE



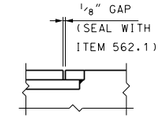
SECTION J-J

SCALE: 1½" = 1'-0"



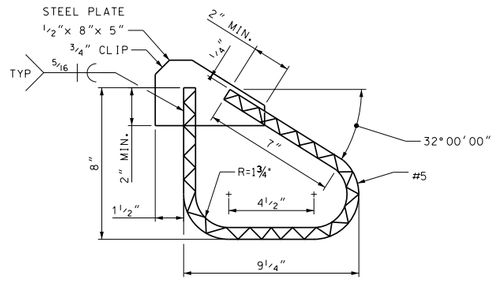
DETAIL L

NOT TO SCALE



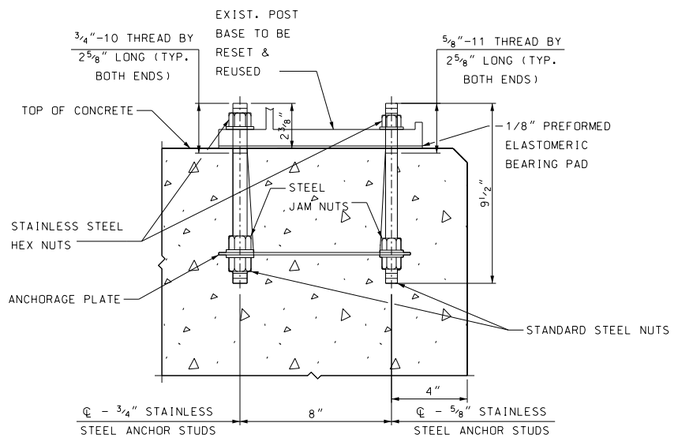
DETAIL M

NOT TO SCALE



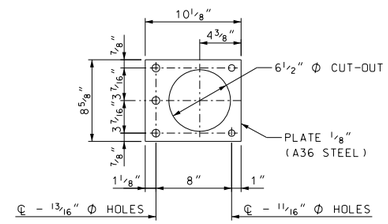
ANCHORAGE DETAIL

NOT TO SCALE



POST ANCHOR ASSEMBLY

SCALE: 3" = 1'-0"



ANCHORAGE PLATE

SCALE: 1½" = 1'-0"

RAIL NOTES:

1. POST SHALL BE NORMAL TO FINISH GRADE.
2. THREADS FOR ANCHOR BOLTS MAY BE ROLLED OR CUT. IF CUT THREADS ARE USED BOLT DIAMETER SHALL NOT BE LESS THAN NOMINAL DIAMETER. IF ROLLED THREADS ARE USED, BOLT DIAMETER SHALL NOT BE LESS THAN ROOT DIAMETER OF THREADS.
3. NUTS FOR ¾" Φ THREADED ANCHOR RODS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ⅛ TURN.

MATERIAL:

1. STAINLESS STEEL ANCHOR STUDS, HEX HEAD BOLTS AND HEX NUTS (TYPE 304) SHALL BE ASTM A276, (100,000 PSI AND 15% ELONGATION).
2. STEEL EMBEDDED JAM AND HEX NUTS SHALL BE ASTM A563 GRADE A OR BETTER.
3. ALUMINUM WASHERS SHALL BE ASTM B209, ALLOY 2024-T3 ALCLAD.
4. PREFORMED ELASTOMERIC BEARING PAD SHALL MEET REQUIREMENTS OF AASHTO M251.

ANCHOR ASSEMBLY NOTES:

1. ¾" & ⅝" AMERICAN STANDARD FINISHED HEXAGON STEEL NUTS ON BOTTOM OF ANCHOR ASSEMBLY, ¾" & ⅝" AMERICAN STANDARD FINISHED HEXAGON STEEL JAM NUTS ON TOP OF ANCHORAGE PLATE.
2. ¾" & ⅝" STAINLESS STEEL HEXAGON NUTS ON TOP ENDS OF BOLTS WITH CLASS 2B THREADS. 13/16" I.D., 1½" O.D., ⅛" THICK ALUMINUM WASHER UNDER NUTS ON TOP. ALL NUTS SHALL COMPLY WITH AMERICAN HEXAGON ANSI SPEC. B18.2. STAINLESS STEEL HEXAGON NUTS SHALL HAVE FULL THREADS.

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LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PIER EXPANSION JOINT (3 OF 3)

BRIDGE SHEET: 8 OF 10

REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17

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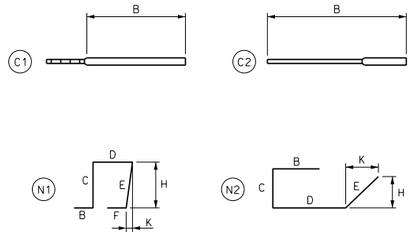
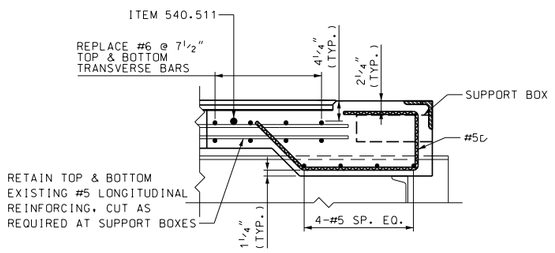
5/24/2018 AT 11:20:35 AM	BRC\PRELIM	40731ExpJoint 3 of 3	AS NOTED

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	----------	12	46

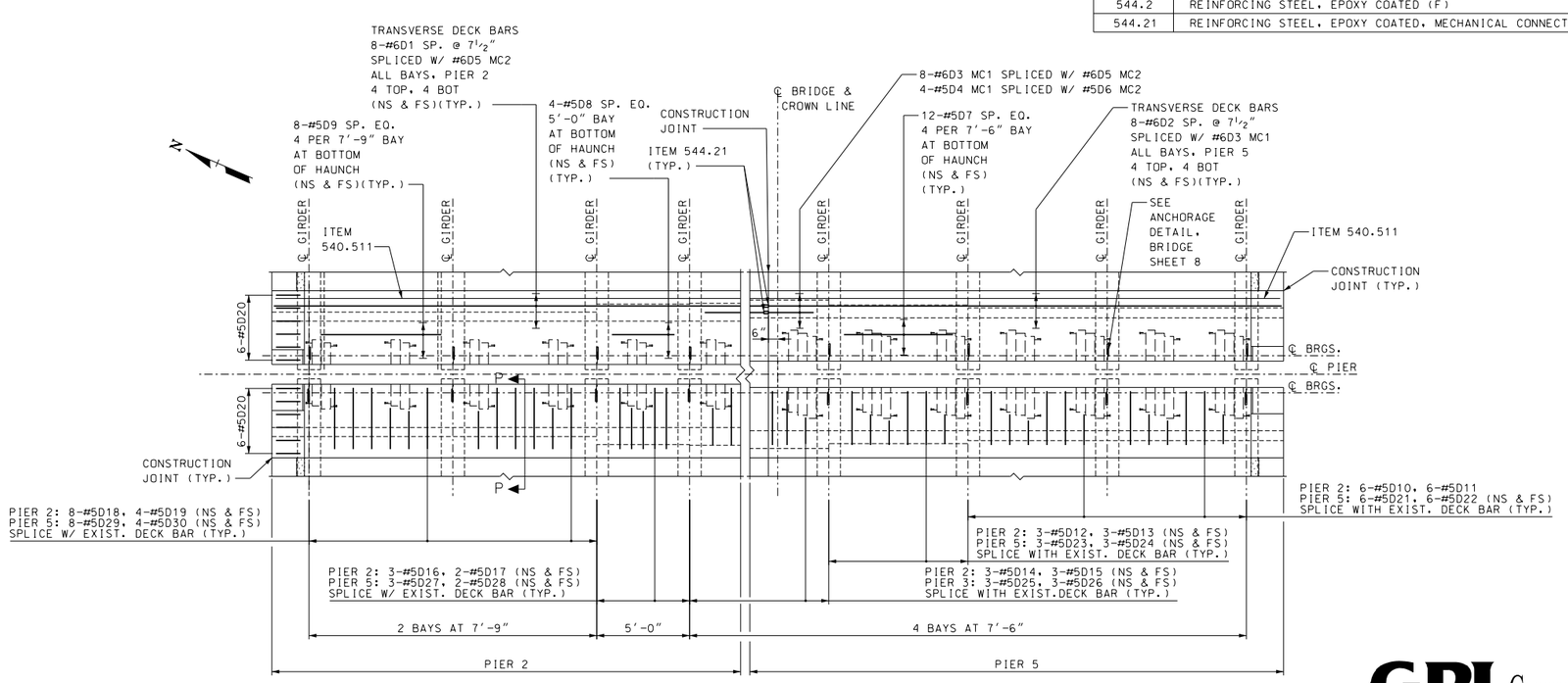


REQUIRED BENDING DIAGRAMS



SECTION P-P

SCALE: ¾" = 1'-0"



DECK REINFORCEMENT PLAN

(SOUTHBOUND BRIDGE - NORTHBOUND SIMILAR)
SCALE: 1/4" = 1'-0"

NOTE:

1. EXISTING REINFORCEMENT NOT SHOWN FOR CLARITY.

REINFORCING SCHEDULE - BR. NO. 199/128 & 199/129

DECK

MARK	SIZE	LENGTH	# PIECES	WEIGHT	TYPE	A	B	C	D	E	F	G	H	J	K
D1	#6	26'-3"	64	2524	--										
D2	#6	27'-3"	64	2620	--										
D3	#6	3'-10"	64	368	C1		3'-10"								
D4	#5	3'-0"	32	100	C1		3'-0"								
D5	#6	3'-10"	64	368	C2		3'-10"								
D6	#5	3'-0"	32	100	C2		3'-0"								
D7	#5	5'-9"	96	576	--										
D8	#5	3'-3"	32	108	--										
D9	#5	6'-0"	64	400	--										
D10	#5	5'-6"	24	138	N2		1'-3"	1'-0"	1'-11¾"	1'-3"			10¾"		10¾"
D11	#5	3'-3"	24	81	N2		6"	9¼"	8¾"	1'-3"			10¾"		10¾"
D12	#5	5'-6"	12	69	N2		1'-3"	12¼"	1'-11¾"	1'-3½"			11"		11"
D13	#5	3'-4"	12	42	N2		6"	9½"	8¾"	1'-3½"			11"		11"
D14	#5	6'-4"	12	79	N2		1'-3"	1'-4"	1'-11¾"	1'-8¾"			1'-2¾"		1'-2¾"
D15	#5	4'-1"	12	51	N2		6"	1'-1¼"	8¾"	1'-8¾"			1'-2¾"		1'-2¾"
D16	#5	6'-5"	12	80	N2		1'-3"	1'-4¾"	1'-11¾"	1'-9½"			1'-3¼"		1'-3¼"
D17	#5	4'-2"	8	35	N2		6"	1'-2"	8¾"	1'-9½"			1'-3¼"		1'-3¼"
D18	#5	5'-5"	32	362	N2		1'-3"	11¾"	1'-11¾"	1'-2½"			10¼"		10¼"
D19	#5	3'-2"	16	106	N2		6"	9"	8¾"	1'-2½"			10¼"		10¼"
D20	#5	4'-6"	96	450	N1		6"	1'-2½"	1'-½"	1'-2½"	6"		1'-2½"		2"
D21	#5	5'-10"	24	146	N2		1'-7"	1'-0"	1'-11¾"	1'-3¼"			10¾"		10¾"
D22	#5	3'-3"	24	81	N2		6"	9¼"	8¾"	1'-3¼"			10¾"		10¾"
D23	#5	5'-11"	12	74	N2		1'-7"	1'-¼"	1'-11¾"	1'-3½"			11"		11"
D24	#5	3'-4"	12	42	N2		6"	9½"	8¾"	1'-3½"			11"		11"
D25	#5	6'-8"	12	83	N2		1'-7"	1'-4"	1'-11¾"	1'-8¾"			1'-2¾"		1'-2¾"
D26	#5	4'-1"	12	51	N2		6"	1'-1¼"	8¾"	1'-8¾"			1'-2¾"		1'-2¾"
D27	#5	6'-9"	12	84	N2		1'-7"	1'-4¾"	1'-11¾"	1'-9½"			1'-3¼"		1'-3¼"
D28	#5	4'-2"	8	35	N2		6"	1'-2"	8¾"	1'-9½"			1'-3¼"		1'-3¼"
D29	#5	5'-10"	32	390	N2		1'-7"	11¾"	1'-11¾"	1'-2½"			10¼"		10¼"
D30	#5	3'-2"	16	106	N2		6"	9"	8¾"	1'-2½"			10¼"		10¼"

TOTAL WEIGHT (LBS)

ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL
544.2	REINFORCING STEEL, EPOXY COATED (F)	0	0	3187	5144	0	0	0	0	8331
544.21	REINFORCING STEEL, EPOXY COATED, MECHANICAL CONNECTORS (F)	0	0	200	736	0	0	0	0	936

REINFORCING NOTES

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET - STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31 (ASTM A615), GRADE 60, EPOXY.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS AND OTHER STANDARD PRACTICE SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. EXISTING REINFORCING STEEL THAT IS TO REMAIN IN PLACE WITH IN THE REMOVAL AREAS SHALL BE CUT AS REQUIRED TO PROVIDE 2½" MINIMUM CLEAR COVER FROM THE PROPOSED CONCRETE SURFACES, EXCEPT AS OTHERWISE NOTED. ALL COSTS INCLUDED IN ITEM 502.10X. ALL NEW REINFORCING BARS SHALL HAVE A MINIMUM CLEAR COVER OF 2½" FROM PROPOSED CONCRETE SURFACES.
4. PLACE REINFORCING STEEL TO AVOID EXPANSION JOINT STEEL.

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services

PRINTED ON	SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
5/24/2018 AT 11:20:36 AM	BRC\PRELIM	40731DeckBars	AS NOTED

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

DECK END REINFORCEMENT & BAR SCHEDULE

BRIDGE SHEET 9 OF 10

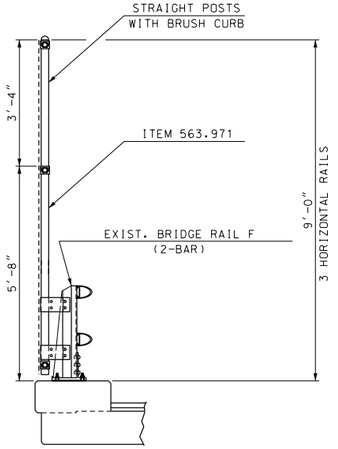
REVISIONS AFTER PROPOSAL	BY	DATE		BY	DATE
	DESIGNED	SRL	11/22/17	CHECKED	RWS	11/22/17
	DRAWN	RWS	11/22/17	CHECKED	SRL	11/22/17
	QUANTITIES	RJG	11/22/17	CHECKED	RWS	11/22/17
	ISSUE DATE				
	REV. DATE				

FILE NUMBER 8-1-1

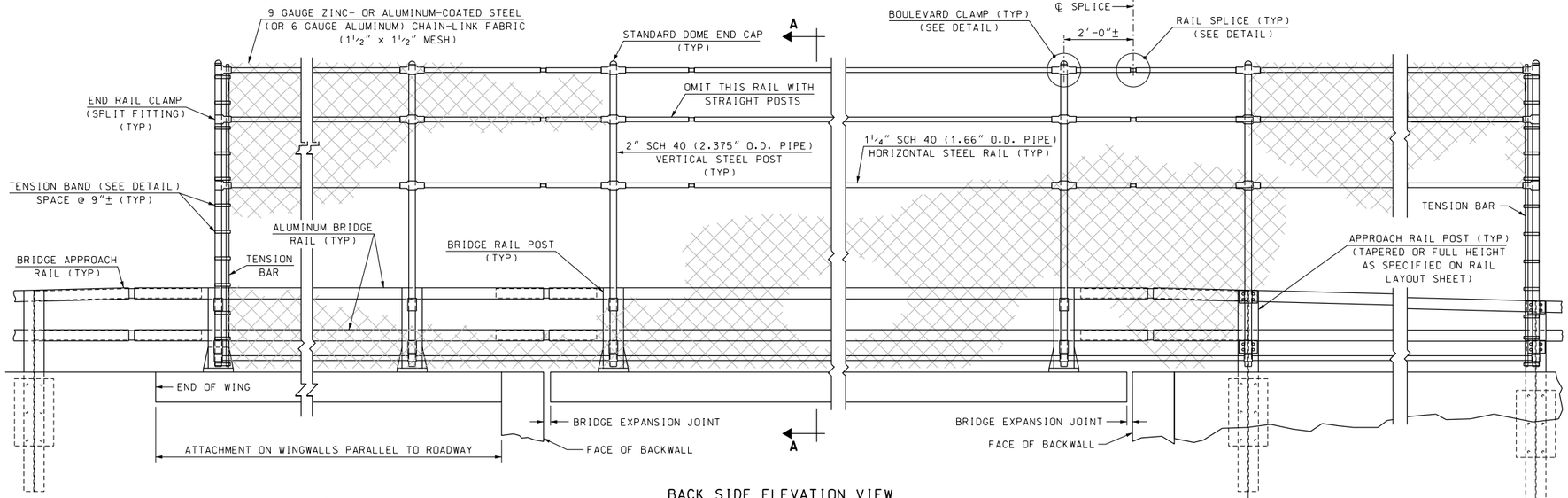
FEDERAL PROJECT NO. ---------

SHEET NO. 13

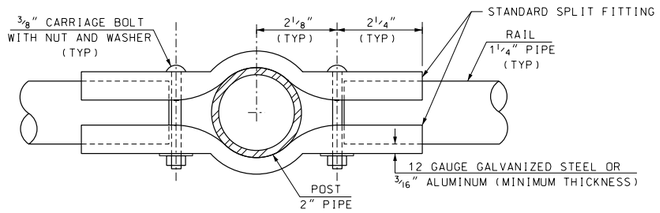
TOTAL SHEETS 46



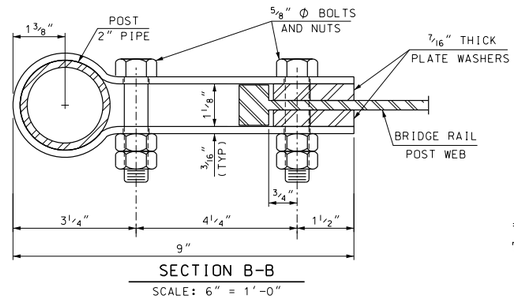
SECTION A-A
SCALE: 1/2" = 1'-0"



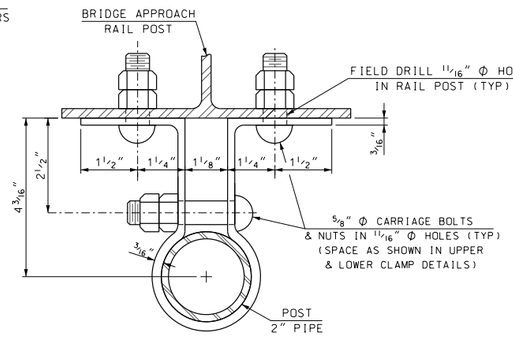
BACK SIDE ELEVATION VIEW
SCALE: 1/2" = 1'-0"



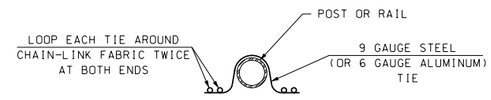
BOULEVARD CLAMP DETAIL
SCALE: 6" = 1'-0"



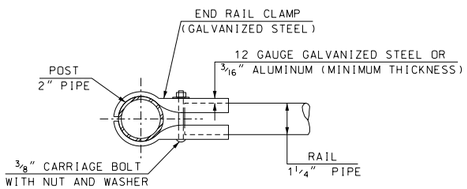
SECTION B-B
SCALE: 6" = 1'-0"



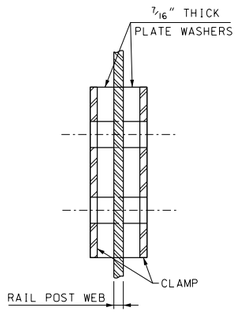
CLAMP AT APPROACH RAIL
SCALE: 6" = 1'-0"



DOUBLE PIGTAILED TIE
NOT TO SCALE



END RAIL CLAMP
(AT END POST)
SCALE: 3" = 1'-0"



SECTION C-C
SCALE: 6" = 1'-0"

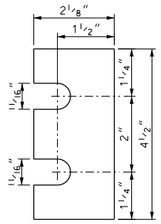
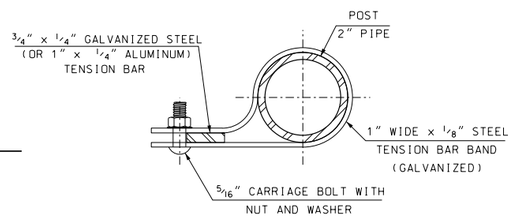
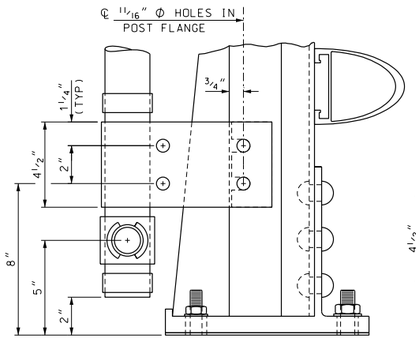


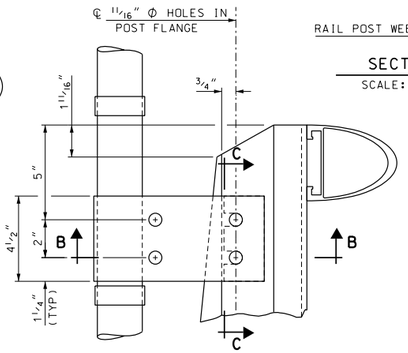
PLATE WASHER DETAIL
SCALE: 6" = 1'-0"



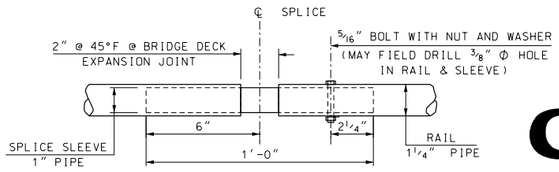
TENSION BAND DETAIL
SCALE: 6" = 1'-0"



LOWER CLAMP DETAILS
TYPICAL WITH 2-BAR & 3-BAR RAIL
(BASE OF FENCE)
SCALE: 3" = 1'-0"



UPPER CLAMP DETAILS
TYPICAL WITH 2-BAR & 3-BAR RAIL
(TOP OF RAIL POST)
SCALE: 3" = 1'-0"



RAIL SPLICE DETAIL
SCALE: 3" = 1'-0"

GENERAL NOTES

(1) CHAIN-LINK FABRIC SHALL BE 9 GAUGE STEEL, ZINC-COATED CONFORMING TO AASHTO M 181, TYPE I, CLASS D (ASTM A 392), ALUMINUM-COATED CONFORMING TO AASHTO M 181, TYPE II (ASTM A 491) OR 6 GAUGE ALUMINUM ALLOY CONFORMING TO AASHTO M 181, TYPE III (ASTM F 1183). CHAIN-LINK FABRIC SHALL BE KNUCKLED ON TOP AND BOTTOM. THE SIZE OF WIRE MESH (FABRIC) SHALL BE 1 1/2".

(2) WIRE TIES SHALL BE STANDARD ROUND 9 GAUGE ZINC- OR ALUMINUM-COATED STEEL OR 6 GAUGE ALUMINUM ALLOY CONFORMING TO ASTM F 626. ALL TIES SHALL BE WRAPPED AROUND CHAIN-LINK FABRIC TWICE (DOUBLE PIGTAILED) AT BOTH ENDS. SPACE TIES @ 6" O.C. TO BOTTOM RAIL AND @ 12" O.C. TO ALL POSTS AND OTHER RAILS.

(3) POST AND RAIL PIPE SHALL BE HOT-DIP GALVANIZED STEEL CONFORMING TO AASHTO M 181, GRADE 1 (ASTM F 1083) OR ALUMINUM ALLOY CONFORMING TO AASHTO M 181 (ASTM B 429, ALLOY 6063-T6). ALL PIPE SHALL BE SCHEDULE 40, STANDARD WEIGHT. NOMINAL PIPE SIZES ARE SHOWN ON THE DRAWING.

(4) TENSION BARS, BAR BANDS, BOULEVARD AND END RAIL CLAMPS SHALL BE STEEL OR ALUMINUM ALLOY CONFORMING TO AASHTO M 181 (ASTM F 626). STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE.

(5) ALL BOLTS AND NUTS SHALL BE STEEL CONFORMING TO ASTM A 307 AND ASTM A 563 GRADE A RESPECTIVELY. WASHERS SHALL BE HARDENED STEEL COMMERCIAL TYPE A PLAIN AND SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ANSI B18.22. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M 111 (ASTM A 123) OR AASHTO M 232 (ASTM A 153) AS APPLICABLE.

(6) RAIL SPLICES SHALL BE PROVIDED AT BRIDGE RAIL SPLICES AS DIRECTED BY THE CONTRACT ADMINISTRATOR.

(7) RAIL MAY BE FIELD CUT (SAWN) TO FIT POST SPACING. GALVANIZED RAIL, CUT OR DRILLED AS ALLOWED, SHALL BE TOUCHED-UP IN ACCORDANCE WITH 563.3.2.2.3.

(8) ALL COSTS FOR CHAIN-LINK FABRIC, POSTS, RAILS AND APPURTENANCES SHALL BE INCLUDED IN ITEM 563.971 PROTECTIVE SCREENING FOR OVERPASS STRUCTURES RAIL F.

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER
BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731
LOCATION I-293 AND NH 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PROTECTIVE SCREEN WITH ALUMINUM RAIL

BRIDGE SHEET 10 OF 10

REVISIONS AFTER PROPOSAL	BY	DATE

DESIGNED	NHDOT	9/98	CHECKED	CMW	10/98
DRAWN	GMC	2/06	CHECKED	PJP/MGL	4/06
QUANTITIES			CHECKED		
ISSUE DATE	11/98	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS	
REV. DATE	12/20/13	---------	14	46	

FILE NUMBER 8-1-1

PRINTED ON	SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
5/24/2018 AT 11:20:38 AM	English/AL-RAIL	40731 AL-ProScreen	AS NOTED

I-293 NORTHBOUND
STA. 314+67
BEGIN CONSTRUCTION

GRID

MERRIMACK RIVER

I-293 NB

I-293 SB

I-293
ON RAMP

315+00

320+00

325+00

420+00

425+00

PCC 320+23.12

PT 325+19.93

PT 425+94.19

PROP. RUMBLE STRIPS

PROP. RUMBLE STRIPS

RESET GRANITE CURB
AS NEEDED TO INSTALL
PROP. CATCH BASIN

INSTALL PROP. CB
MATCH EXIST.
PAVEMENT DEPTH
ALL EARTHWORK
IS SUBSID.

I-293 SOUTHBOUND
STA. 419+97
BEGIN CONSTRUCTION

STA. 328+24.84 ℄ WB CONST. BACK =
STA. 128+60.00 ℄ MEDIAN CONST. AHEAD

STA. 430+47.27 ℄ EB CONST. BACK =
STA. 128+60.00 ℄ MEDIAN CONST. AHEAD

STA. 138+40.00 ℄ MEDIAN CONST. BACK =
STA. 338+40.00 ℄ WB CONST. AHEAD

PROP. RUMBLE STRIPS

PC 339+73.82

I-293
ON RAMP

240+00

130+00

135+00

440+00

MATCH TO BELOW

I-293 OFF RAMP

PC 439+71.12

STA. 138+40.00 ℄ MEDIAN CONST. BACK =
STA. 438+40.00 ℄ EB CONST. AHEAD

100 0 100 200
SCALE IN FEET

I-293 NORTHBOUND
STA. 346+50
END CONSTRUCTION

I-293 ON RAMP

I-293 NB

350+00

450+00

I-293 SB

345+00

445+00

MATCH TO ABOVE

I-293 OFF RAMP

BROWN AVENUE

GRID

100 0 100 200
SCALE IN FEET

I-293 SOUTHBOUND
STA. 446+50
END CONSTRUCTION

NOTES:

1. APART FROM THE BRIDGE DECK, I-293 SHALL BE COLD PLANED (ITEM 417.) FULL WIDTH (INCLUDING SHOULDERS) TO A DEPTH OF 1½" WITHIN THE PROJECT LIMITS OF WORK. REFER TO BRIDGE PLANS FOR THE PROPOSED BRIDGE PAVING.

2. THE SAME I-293 LIMITS OF COLD PLANING SHALL HAVE 1½" OF WEARING COURSE (ITEM 403.11902) CONSTRUCTED.

3. INSTALL RUMBLE STRIPS (ITEM 417.416) ALONG I-293 AS PER NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION.

NUMBER	DESCRIPTION	STATION	STATION	DATE
	REVISIONS AFTER PROPOSAL			

SDR PROCESSED	-	DATE -
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

GENERAL PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731genplan	40731	15	46

I-293 NB

ROUTE 101 WB

I-293 NORTHBOUND
STA. 314+67
BEGIN CONSTRUCTION

CURVE 1
PI Sta. 316+59.76
N = 162830.67
E = 1037803.78
Δ = 29°22'39.01"
R = 1450.00'
T = 380.10'
L = 743.46'

GRID N

CURVE 2
PI Sta. 322+72.95
N = 162828.87
E = 1038433.71
Δ = 14°58'53.83"
R = 1900.00'
T = 249.83'
L = 496.81'

312+00
PC 312+79.66
313+00
314+00
315+00
316+00
317+00
318+00 CURVE 1
319+00
320+00
PCC 320+23.12
321+00
322+00
323+00 CURVE 2
324+00
325+00
PT 325+19.93
326+00
N75°10'56.53"E

±12'
±12'
±12'
±12'
±10'
±14'
±12'
±2'

6" SSLW
6" SBLW
6" SSLY
12" SSLW(T)
12'
12'
12'
12'

I-293 NB

I-293 SB

I-293 ON RAMP

414+00
415+00
416+00
417+00
PC 417+05.51
418+00
419+00
420+00
421+00 CURVE 4
422+00
423+00
424+00
425+00
426+00
427+00
428+00
N75°10'56.53"E
PT 425+94.19

±13.5'
±15'
±12'
±12.5'
±15'

12" SSLW(T)
6" SSLY
6" SBLW
6" SSLW
5'
12'
12'
12'
12'

MATCH TO SHEET 17

I-293 SOUTHBOUND
STA. 419+97
BEGIN CONSTRUCTION

CURVE 4
PI Sta. 421+60.25
N = 162659.78
E = 1038113.20
Δ = 29°57'06.01"
R = 1700.00'
T = 454.75'
L = 888.68'

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	-	DATE -
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

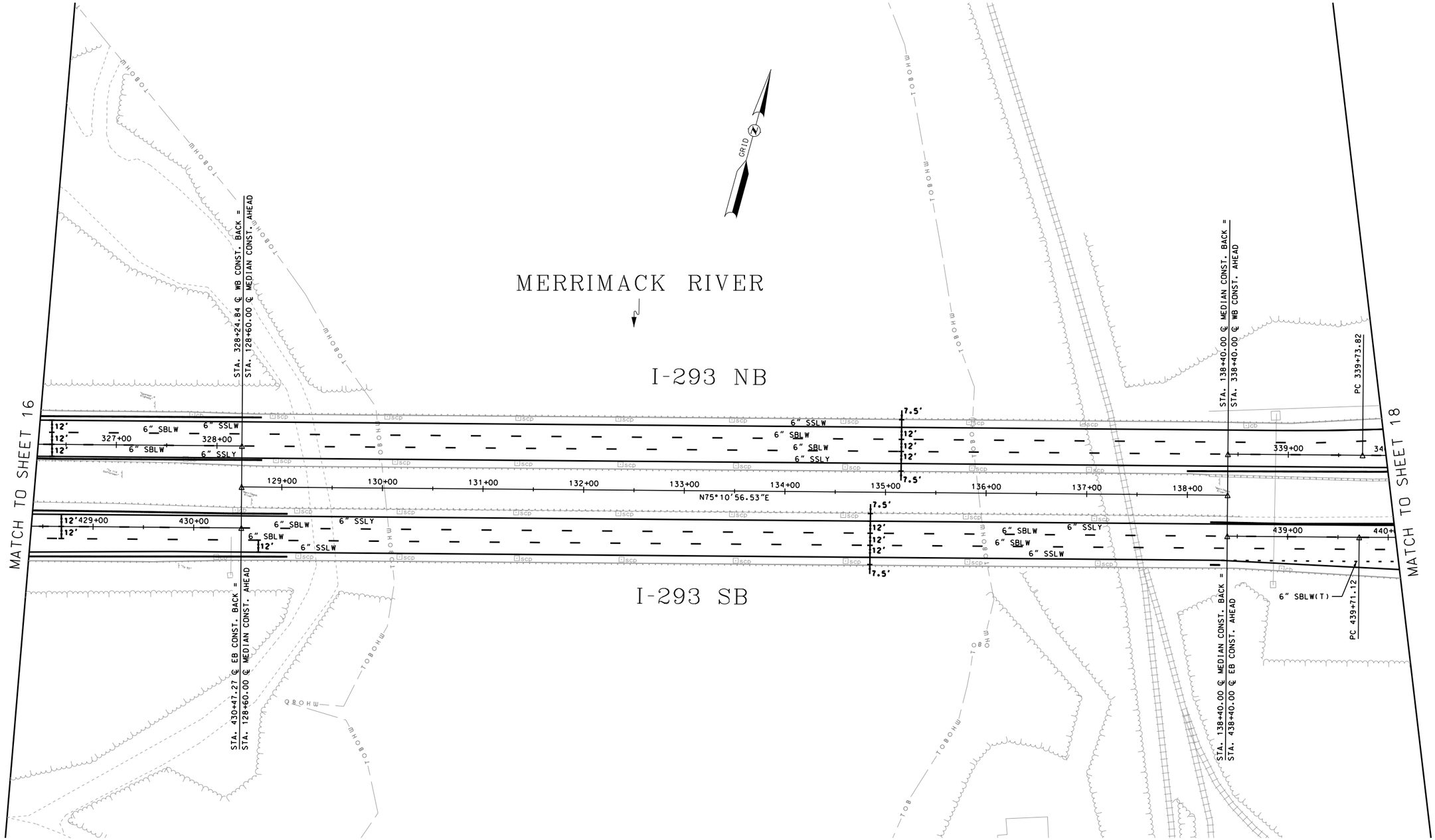
FINAL PAVEMENT MARKING PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731pvm	40731	16	46

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED	–	DATE –
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE



50 0 50 100

SCALE IN FEET

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

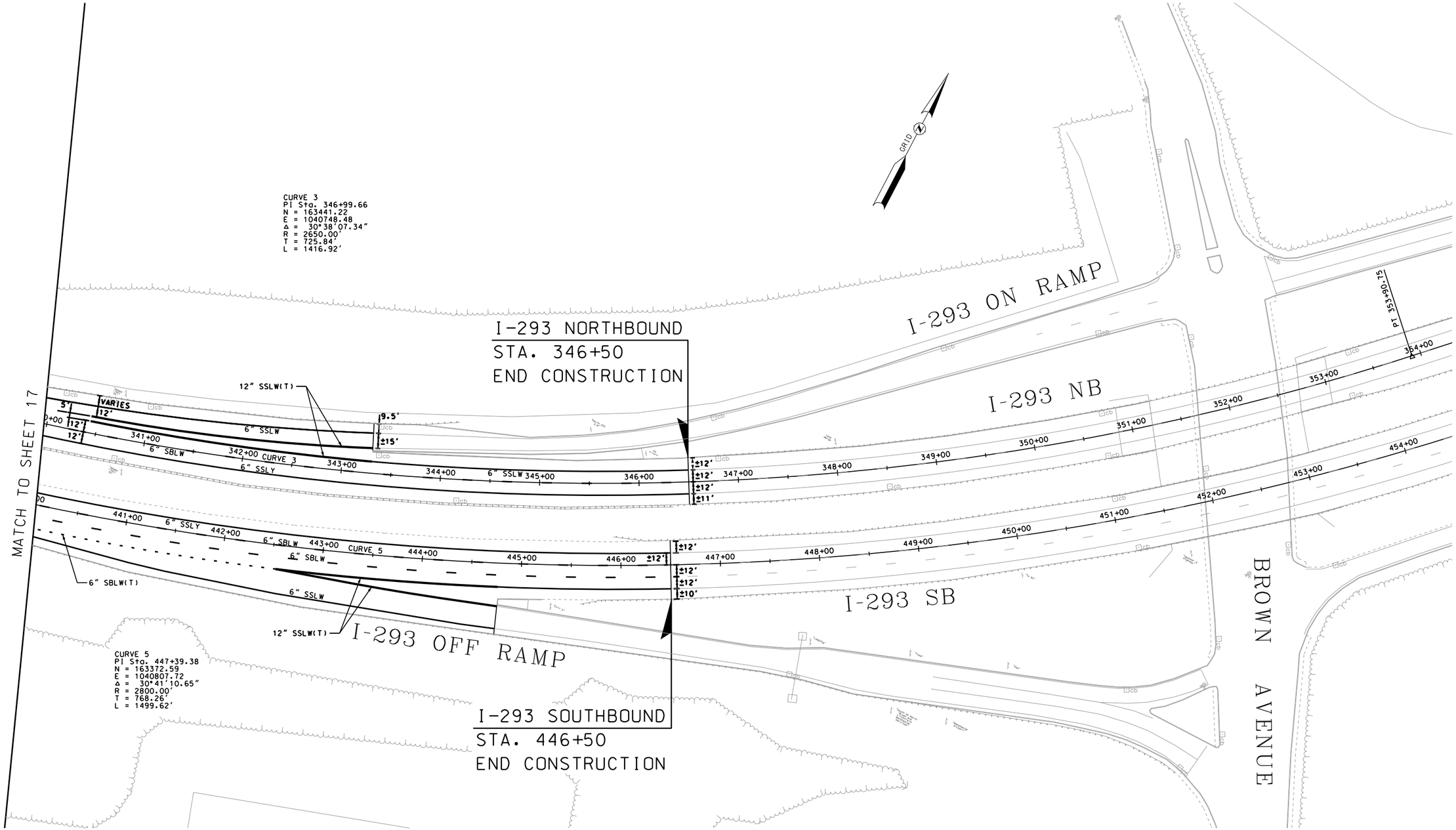
FINAL PAVEMENT MARKING PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731pvm	40731	17	46

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED – DATE –
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE



50 0 50 100
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

FINAL PAVEMENT MARKING PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731pvm	40731	18	46

NOTES:

1. ATTACH PROPOSED GA-24 AND R5-2a SIGNS TO EXISTING SIGN POSTS.

2. THE CONTRACTOR SHALL IMPLEMENT THE PERMANENT LANE USE MODIFICATION ALONG THE BROWN AVENUE NB APPROACH TO THE I-293 SB ON RAMP AS SOON AS POSSIBLE IN THE CONTRACT AND WELL IN ADVANCE OF IMPLEMENTING THE PROJECT DETOUR.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	–	DATE –
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

FINAL PAVEMENT MARKING PLANS

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731pvm_BrownAve	40731	19	46

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
615.0501	GA-24	60	60	NORTH 3A CENTER LANE			7C/6C 6C	18			1	25	25						ATTACH TO EXISTING SIGN POSTS WHITE/GREEN
615.0601	R3-8(335)	48	30	ONLY			MUTCD STANDARD				1	10	10						ATTACH TO EXISTING SIGN POSTS BLACK/WHITE
615.032	R3-8(35)	30	30	ONLY ONLY							1	6.25	6.25	X				1	BLACK/WHITE
615.0601	R5-2a	30	30	NO TRUCKS							3	6.25	18.75						ATTACH TO EXISTING SIGNAL POLES OR SIGN POSTS, IN PLACE OF EXISTING R5-2a SIGNS, AS SHOWN ON THE PLANS BLACK/WHITE

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS

GENERAL NOTES

1. REFER TO THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION PUBLISHED BY THE NHDOT.
2. REFER TO THE LATEST EDITION OF THE STANDARD PLANS FOR ROAD CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS AND NHDOT SPECIFIC SIGNS.
3. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
4. THE ALUMINUM OR U-CHANNEL POST SHALL BE FLUSH WITH THE TOP OF THE SIGN ON ALL SINGLE POST ASSEMBLIES.

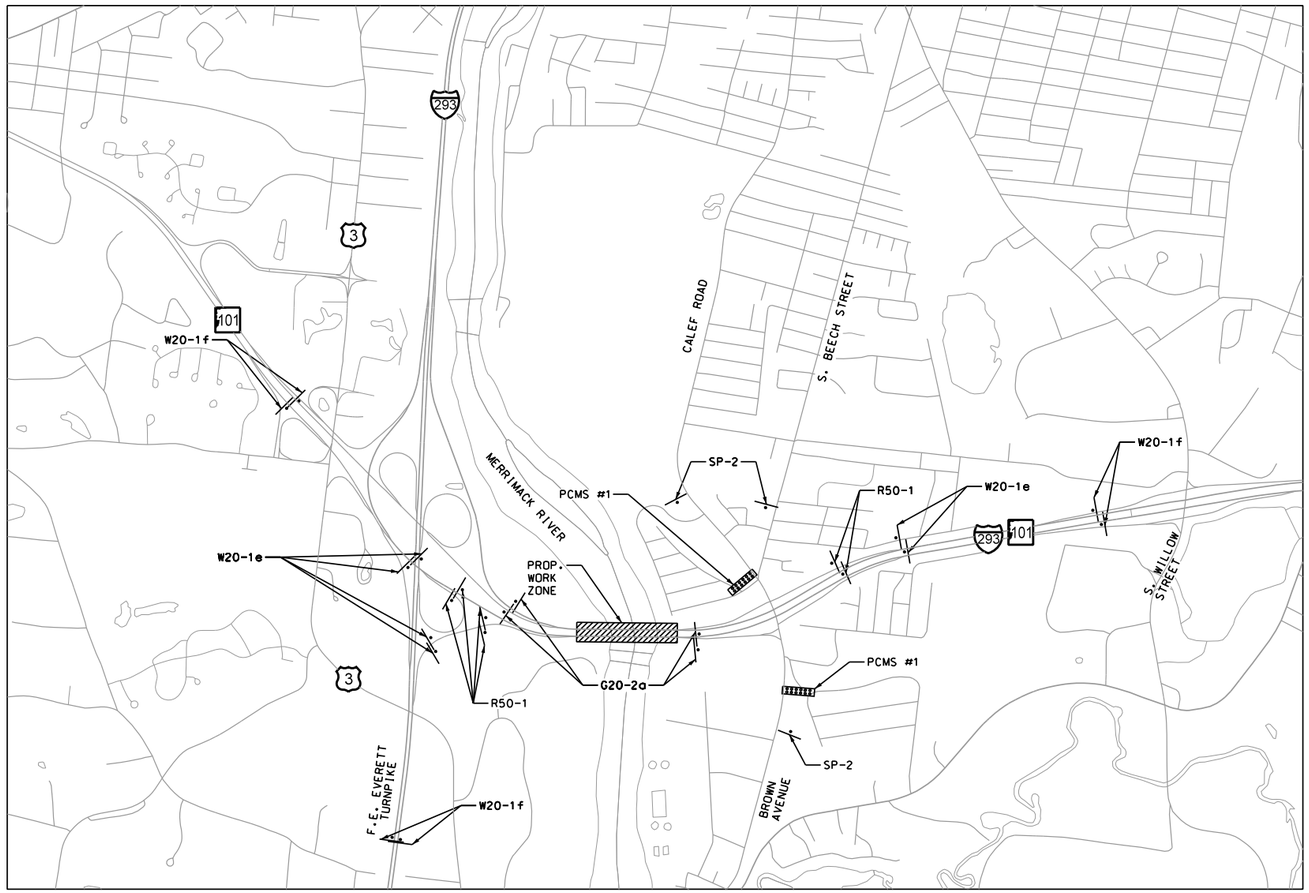
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF TRAFFIC

PERMANENT SIGN SUMMARY

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731PermSignSummary	40731	20	46

I-293 BRIDGE REHABILITATION - ADVANCE WARNING SIGN PLAN



1000 0 1000 2000

SCALE IN FEET

END
ROAD WORK

G20-2a

R50-1

I-293 NB ON
RAMP CLOSED
FOLLOW
DETOUR

SP-2

W20-1e

W20-1f

PCMS #1 - PORTABLE CHANGEABLE MESSAGE SIGN #1

MESSAGE 1:	NEW TRAFFIC PATTERN
MESSAGE 2:	PLEASE STAY ALERT

MESSAGE TO BE DISPLAYED
WHILE DETOUR IS ACTIVE

NOTES:

1. MESSAGES SHALL BE DISPLAYED AS SHOWN OR AS DIRECTED BY THE ENGINEER.

2. ACTUAL LOCATIONS OF PORTABLE CHANGEABLE MESSAGE SIGNS TO BE DETERMINED IN THE FIELD IN COORDINATION WITH THE ENGINEER.

3. IT IS INTENDED THAT TWO (2) PORTABLE CHANGEABLE MESSAGE SIGNS WILL BE POSITIONED TO DIRECT TRAFFIC EXITING THE MANCHESTER AIRPORT AND DESTINED FOR I-293 NB/RT 101 WB TO UTILIZE THE AIRPORT ACCESS ROAD (RAYMOND WIECZOREK DRIVE). ACTUAL MESSAGE AND SIGN LOCATIONS TO BE DETERMINED IN THE FIELD IN COORDINATION WITH THE ENGINEER.

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	-	DATE -
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

ADVANCE WARNING SIGN PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731adv_warn	40731	21	46

PCMS 05
MM 53.4
42.953726, -71.483372
Platform Required: No
Coordinate with NHDOT to relocate existing trailer mounted message board at this location

PQT 13
MM 53.4
42.953602, -71.483235
Platform Required: No

PQT 04
MM 53.8
42.950554, -71.476630
Platform Required: No
Behind Median Guardrail

PTZ 02
101 EB near 293 SB merge
42.949810, -71.475505
Platform Required: No
View of potential traffic backups at I-293 SB/NH 101 EB merge

PQT 03
I-293 SB Ramp Inside infield for FEE/101/293 Interchange
42.949801, -71.475305
Platform Required: No
Facing I-293 ramp traffic

PQT 16
Exit ramp infield of I-293 SB/NH 101 EB to FEE SB
42.947701, -71.472708
Platform Required: No
Facing I-293 SB/NH 101 EB traffic

PQT 05
I-293 SB/NH 101 EB West Infield
at FEE NB Ramp
42.946472, -71.467856
Platform Required: No
Facing I-293/101 traffic

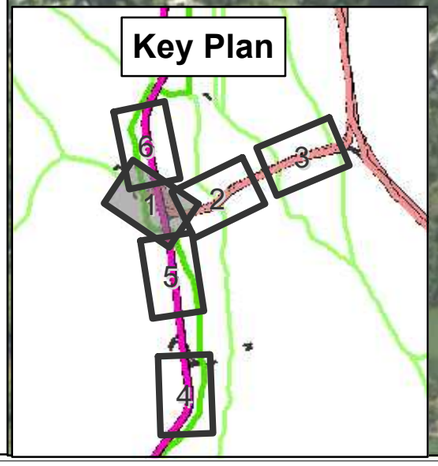
PQT 15
FEE NB to I-293 SB/NH 101 EB on-ramp
42.946016, -71.468176
Platform Required: Yes
Facing ramp traffic

PQT 12
FEE NB Ramp to I-293 SB/NH 101 EB
42.944538, -71.470511
Platform Required: No
Facing I-293 SB/NH 101 EB on-ramp traffic

PTZ 03
FEE NB Ramp to I-293 SB/NH 101 EB
42.944508, -71.470515
Platform Required: No
View of potential traffic backups on the FEE

Interstate 293 S
Interstate 293 N
NH Route 101 W
NH Route 101 E
N H 101 By-Pass
F.E. Everett Turnpike Southbound
F.E. Everett Turnpike
F.E. Everett Tpke S
F.E. Everett Tpke N
South River Rd
101
293
3

Key Plan



Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

0 150 300 600 900 1,200 Feet

N

REVISIONS AFTER PROPOSAL	NUMBER	DATE	STATION	DESCRIPTION

		DATE
SDR PROCESSED		
NEW DESIGN	DNL	8/24/2017
SHEET CHECKED	CEB	8/24/2017
AS-BUILT DETAILS		

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

SWZ Layout (Sheet 1 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	22	46

PQT 06
MM 3.2
42.946599, -71.464127
Platform Required: Yes
Behind NB/WB guardrail, outside of clear zone for I-293 SB/NH 101 EB travel way.
Facing I-293 SB/NH 101 EB traffic

PTZ 01
MM 3.2
42.946611, -71.464040
Platform Required: Yes
Behind NB/WB guardrail, outside of clear zone for I-293 SB/NH 101 EB travel way.

PQT 08
MM 2.3
42.953059, -71.448372
Platform Required: No

Existing Permanent
RWIS System

Existing Smart Work Zone
Trailer Mounted Sign and Queue Sensor
(14633Z Salem-Manchester)

Proposed Smart Work Zone
Trailer Mounted Sign in Median
(13953 Bedford 101)

PQT 07
MM 2.8
42.948319, -71.456744
Platform Required: No
Install in front of soundwall outside clearzone, during I-293 NB/NH 101 WB Exit 2 on ramp is closure

NH Route 101 W

Brown Ave

3A

Interstate 293 N

Interstate 293 S

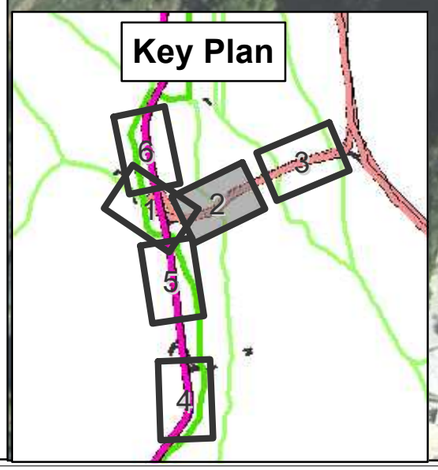
101 293

101 293

N

0 150 300 600 900 1,200 Feet

Key Plan



Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

		DATE
SDR PROCESSED		
NEW DESIGN	DNL	8/24/2017
SHEET CHECKED	CEB	8/24/2017
AS-BUILT DETAILS		

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

SWZ Layout (Sheet 2 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	23	46

PQT 09
MM 1.6
42.957261, -71.435086
Platform Required: No
In median behind guardrail,
facing I-293 NB/101 WB traffic approaching workzone

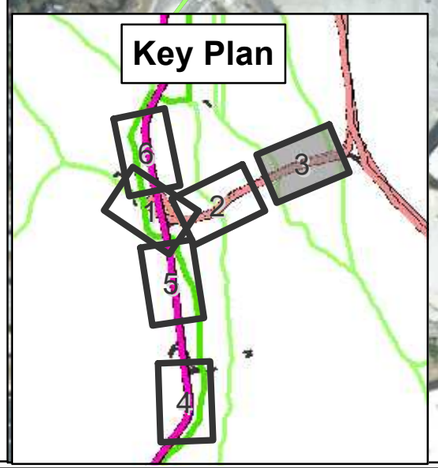
PQT 10
MM 0.9
42.960557, -71.423534
Platform Required: No

PCMS 04
MM 0.9
42.960566, -71.423488
Platform Required: No

Existing permanent CCTV,
Overhead DMS and VSL.

Existing Smart Work Zone
Trailer Mounted Queue Sensor
(14633Z Salem-Manchester)

S Willow St
28
101
293
Interstate 293 N
Interstate 293 S
Huse Rd
28A
S Mammoth Rd



N

0 150 300 600 900 1,200 Feet

Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

SWZ Layout (Sheet 3 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	24	46

REVISIONS AFTER PROPOSAL

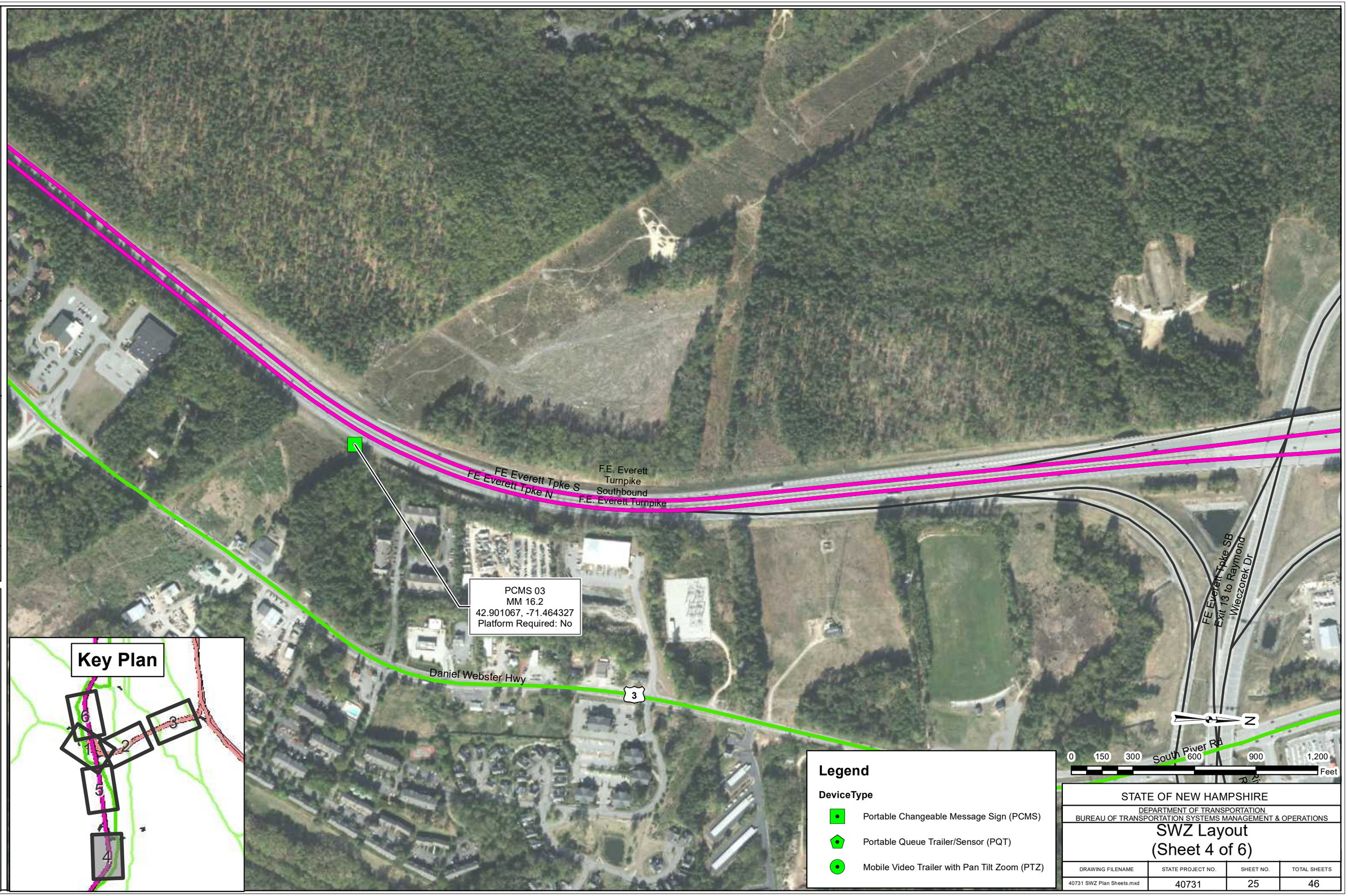
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED		DATE
NEW DESIGN	DNL	DATE 8/24/2017
SHEET CHECKED	CEB	DATE 8/24/2017
AS-BUILT DETAILS		DATE

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED		DATE
NEW DESIGN	DNL	DATE 8/24/2017
SHEET CHECKED	CEB	DATE 8/24/2017
AS-BUILT DETAILS		DATE



Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

SWZ Layout (Sheet 4 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	25	46

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION	STATION

		DATE
SDR PROCESSED		
NEW DESIGN	DNL	8/24/2017
SHEET CHECKED	CEB	8/24/2017
AS-BUILT DETAILS		

F.E. Everett Turnpike Southbound

FE Everett Tpke N

F.E. Everett Turnpike

FE Everett Tpke S

PCMS 02
MM 18
42.926312, -71.466881
Platform Required: No

PQT 14
MM 18.4
42.932073, -71.467839
Platform Required: Yes

Coordinate with NHDOT to Relocate Existing Trailer Mounted Sign

PCMS 01
MM 18.9
42.939397, -71.469274
Platform Required: Yes

PQT 11
MM 18.9
42.939398, -71.469293
Platform Required: Yes

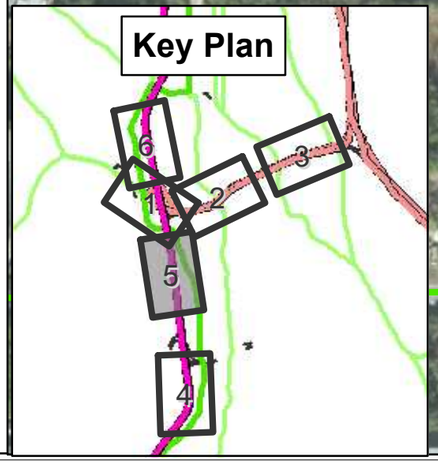
South River Rd

3

N

0 150 300 600 900 1,200 Feet

Key Plan



Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

SWZ Layout (Sheet 5 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	26	46

NH Route 101 E

NH Route 101 W

101

South River Rd

3

Second St

PQT 02
MM 4.2
42.958366, -71.475212
Platform Required: No

PQT 01
MM 4.8
42.966284, -71.477116
Platform Required: No

Proposed Smart Work Zone
Trailer Mounted Sign
(13953 Bedford 101)

Coordinate with NHDOT to Relocate
Existing Trailer Mounted Sign

FE Everett Tpke S

FE Everett Tpke N

Interstate 293 N

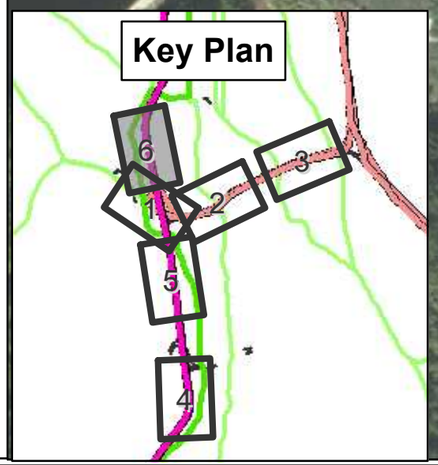
F.E. Everett
Turnpike
Southbound Interstate 293 S

F.E. Everett Turnpike

293

293

Key Plan



Legend

DeviceType

- Portable Changeable Message Sign (PCMS)
- Portable Queue Trailer/Sensor (PQT)
- Mobile Video Trailer with Pan Tilt Zoom (PTZ)

N

0 150 300 600 900 1,200 Feet

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

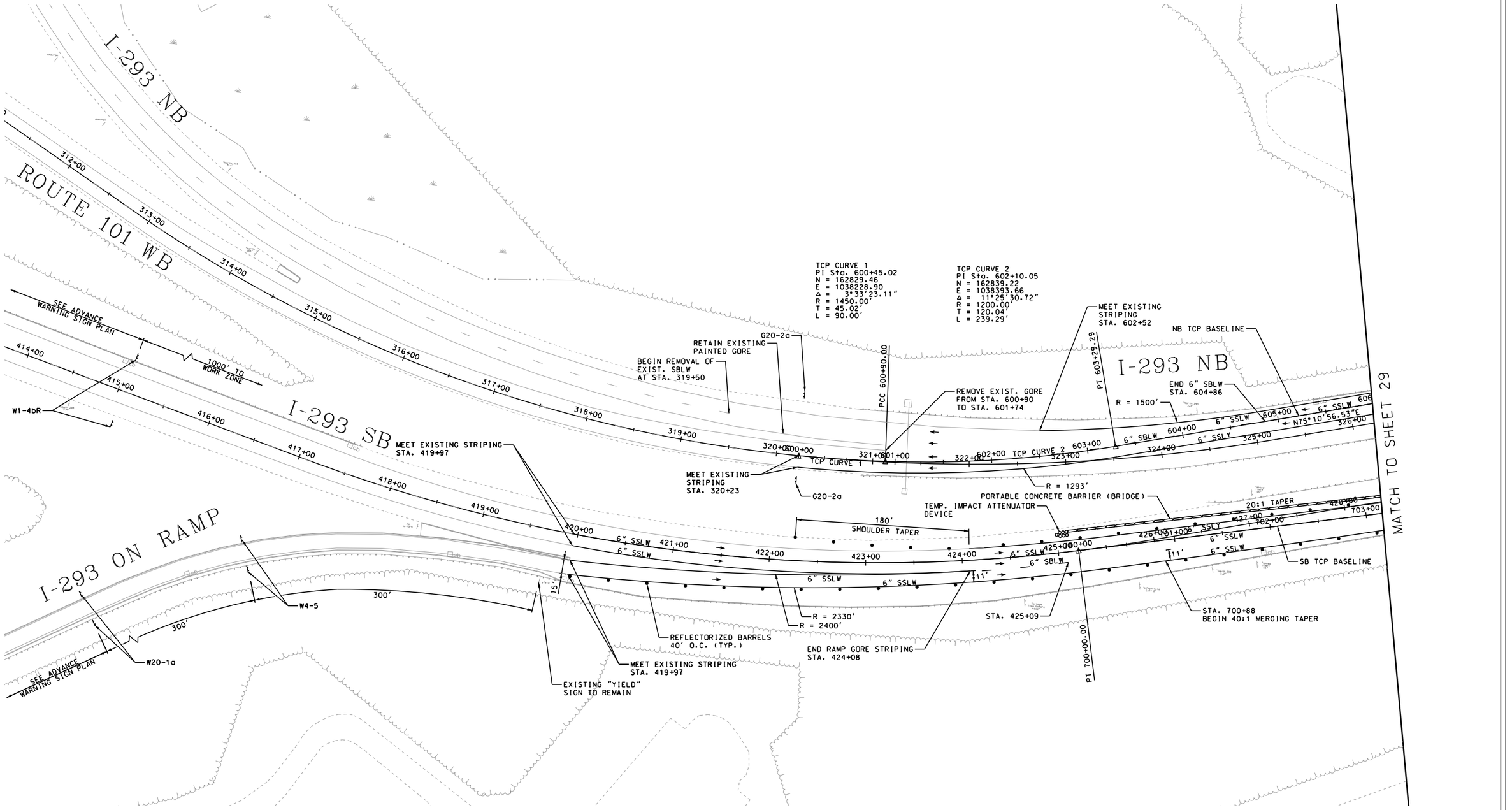
SWZ Layout
(Sheet 6 of 6)

DRAWING FILENAME	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731 SWZ Plan Sheets.mxd	40731	27	46

REVISIONS AFTER PROPOSAL

NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED		DATE
NEW DESIGN	DNL	DATE 8/24/2017
SHEET CHECKED	CEB	DATE 8/24/2017
AS-BUILT DETAILS		DATE



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE. AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

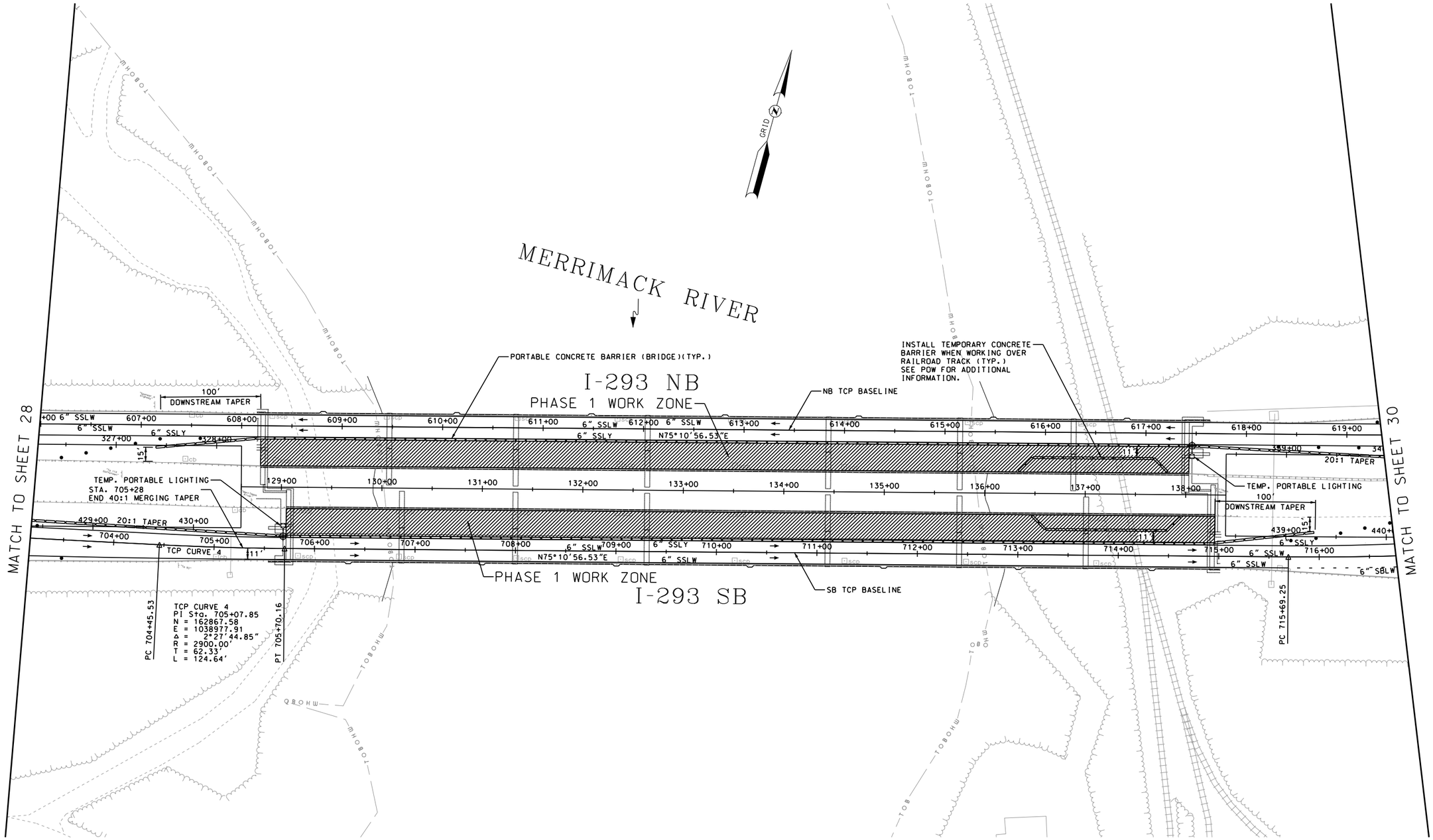
NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED – DATE –
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS
PHASE 1

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 1	40731	28	46



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE. AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

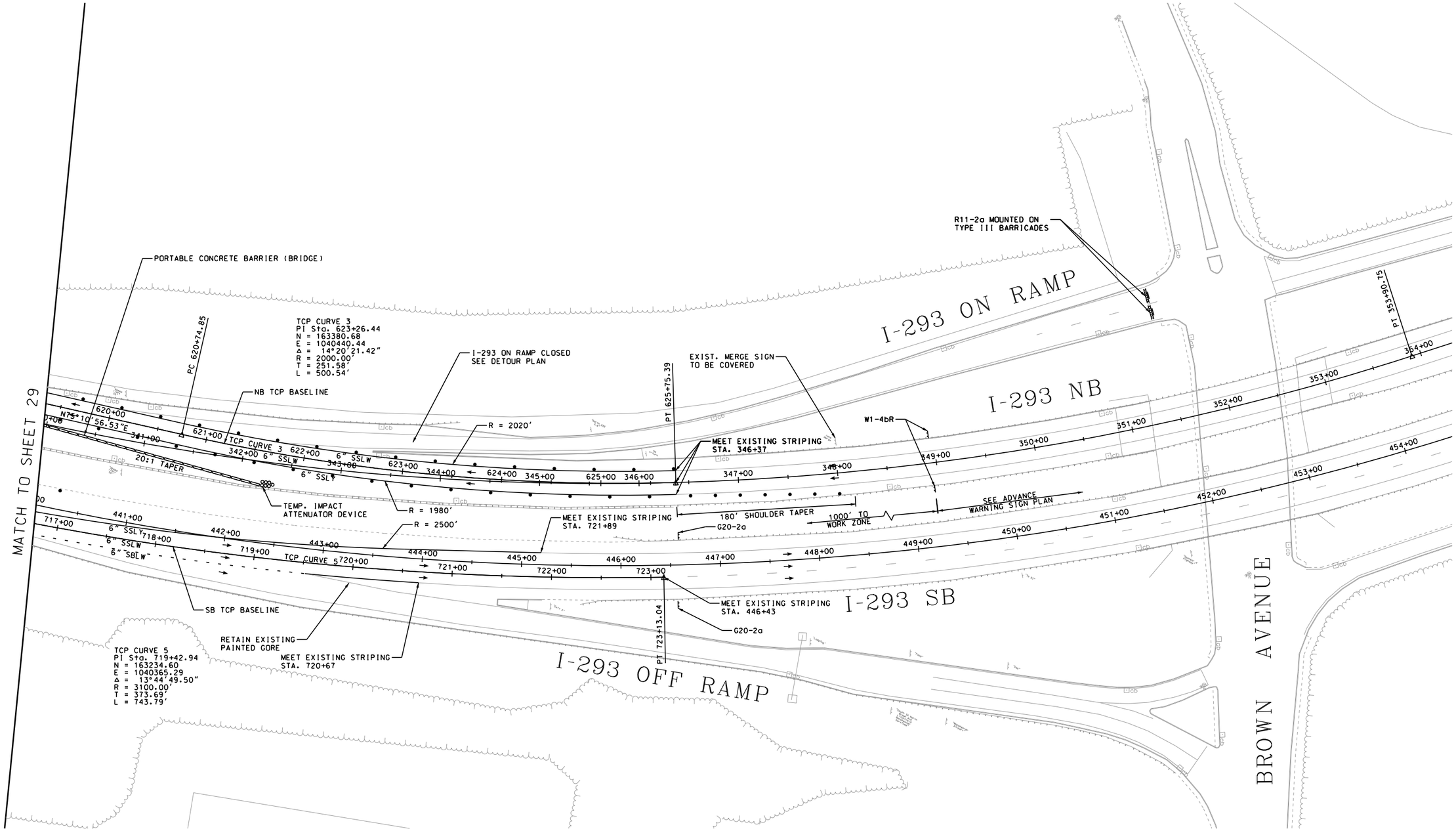
NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED - DATE -
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS
PHASE 1

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 1	40731	29	46



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE, AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

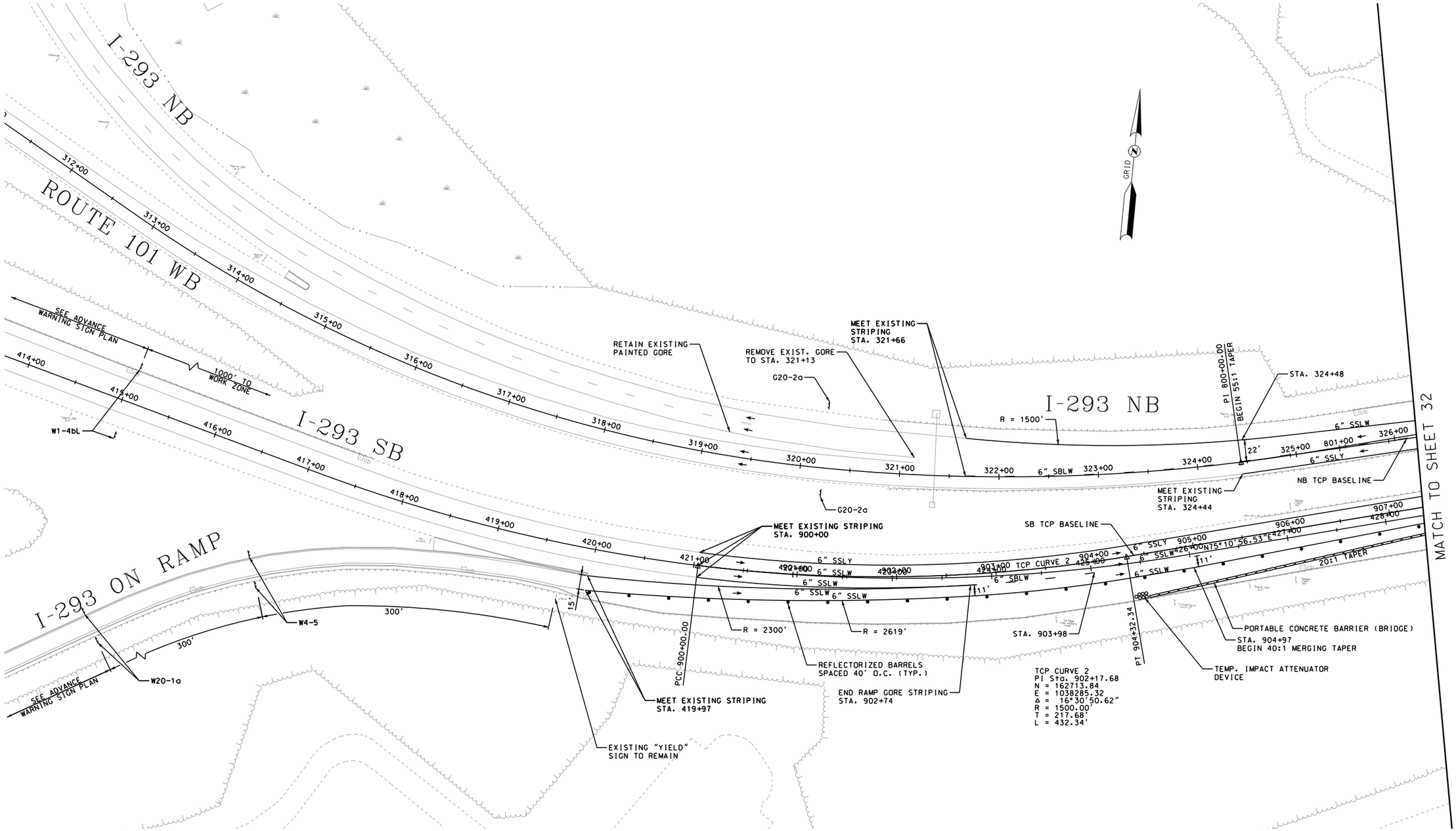
SDR PROCESSED	-	DATE -
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS
PHASE 1

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 1	40731	30	46



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE, AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

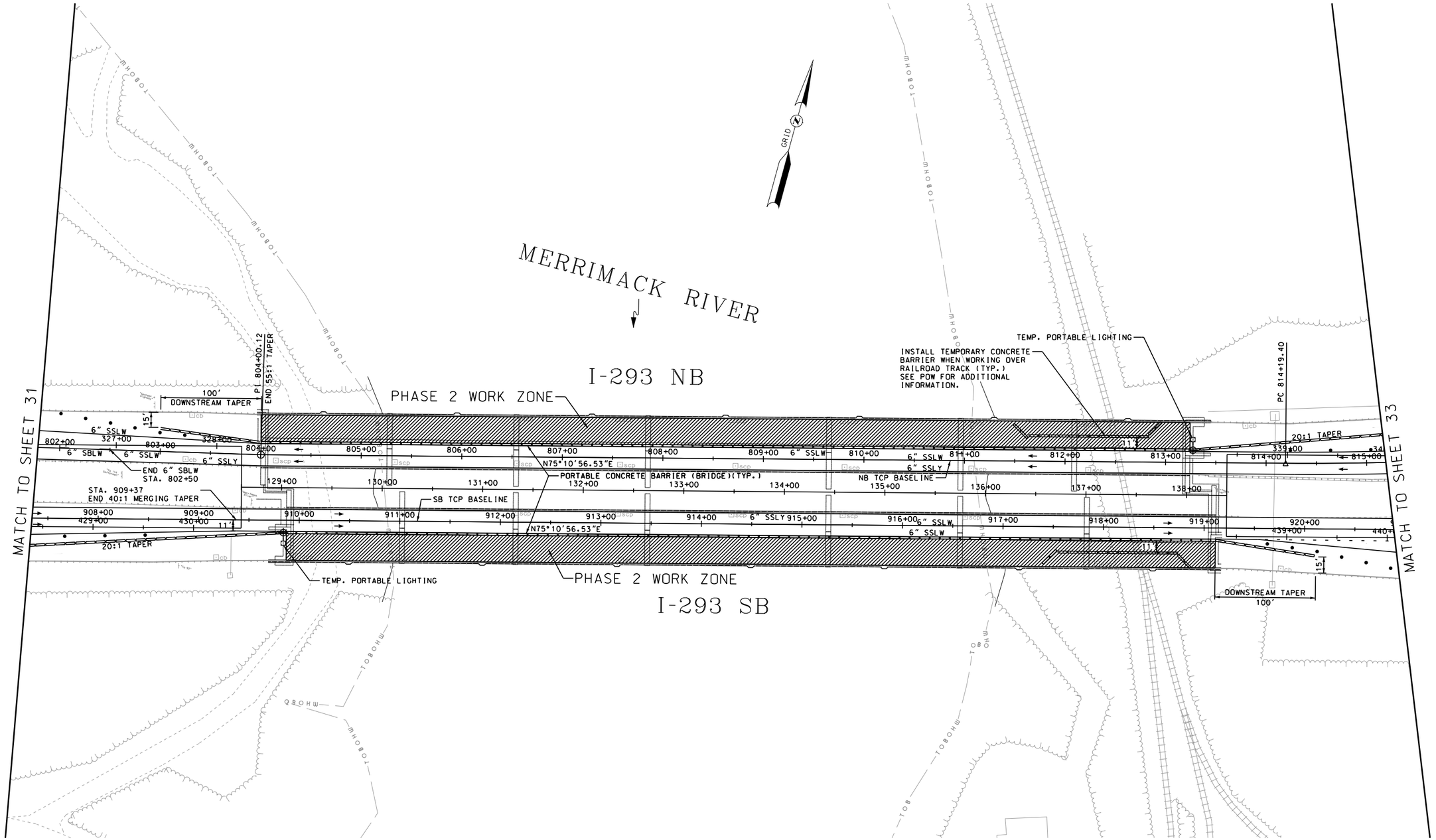
		DATE
SDR PROCESSED	-	-
NEW DESIGN	ROL	05/16/18
SHEET CHECKED	JPJ	05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS PHASE 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 2	40731	31	46



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE. AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

NUMBER	DESCRIPTION	STATION	DATE
	REVISIONS AFTER PROPOSAL		

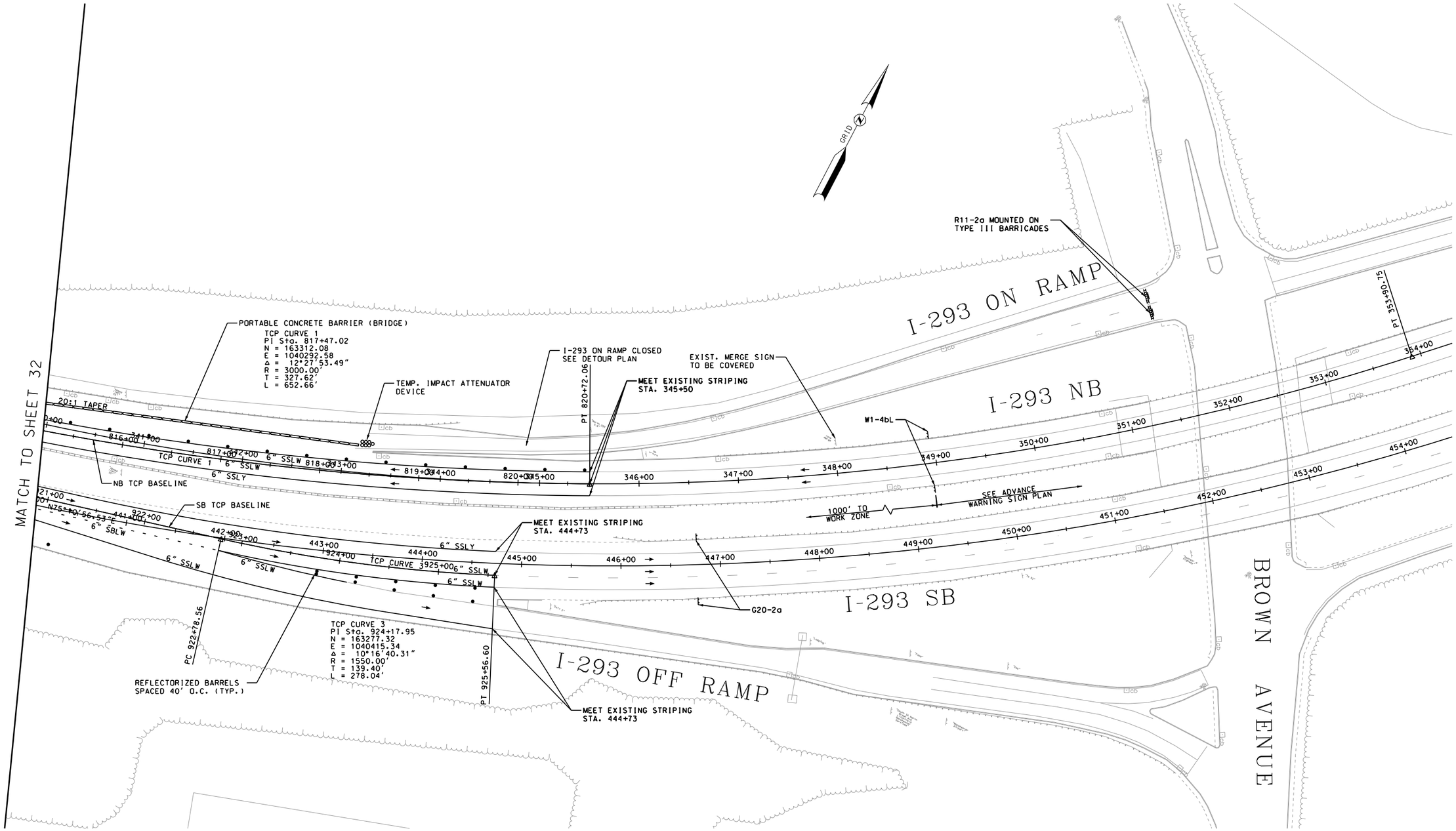
SDR PROCESSED	–	DATE –
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS PHASE 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 2	40731	32	46



NOTES:

1. EXIST. PAVEMENT MARKINGS THAT CONFLICT WITH TEMP. MARKINGS SHALL BE REMOVED.
2. REMOVE AND INLAY EXIST. RUMBLE STRIPS WITHIN PROJECT LIMITS.
3. TEMPORARY PORTABLE LIGHTING SHALL BE SET IN LOCATIONS TO ILLUMINATE THE ANGLE POINT OF THE PORTABLE CONCRETE BARRIER WHERE IT MEETS THE TRAVEL LANE. AS DIRECTED BY THE ENGINEER.
4. MAINTAIN 11' MIN. LANES THROUGH WORK ZONE.

50 0 50 100
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

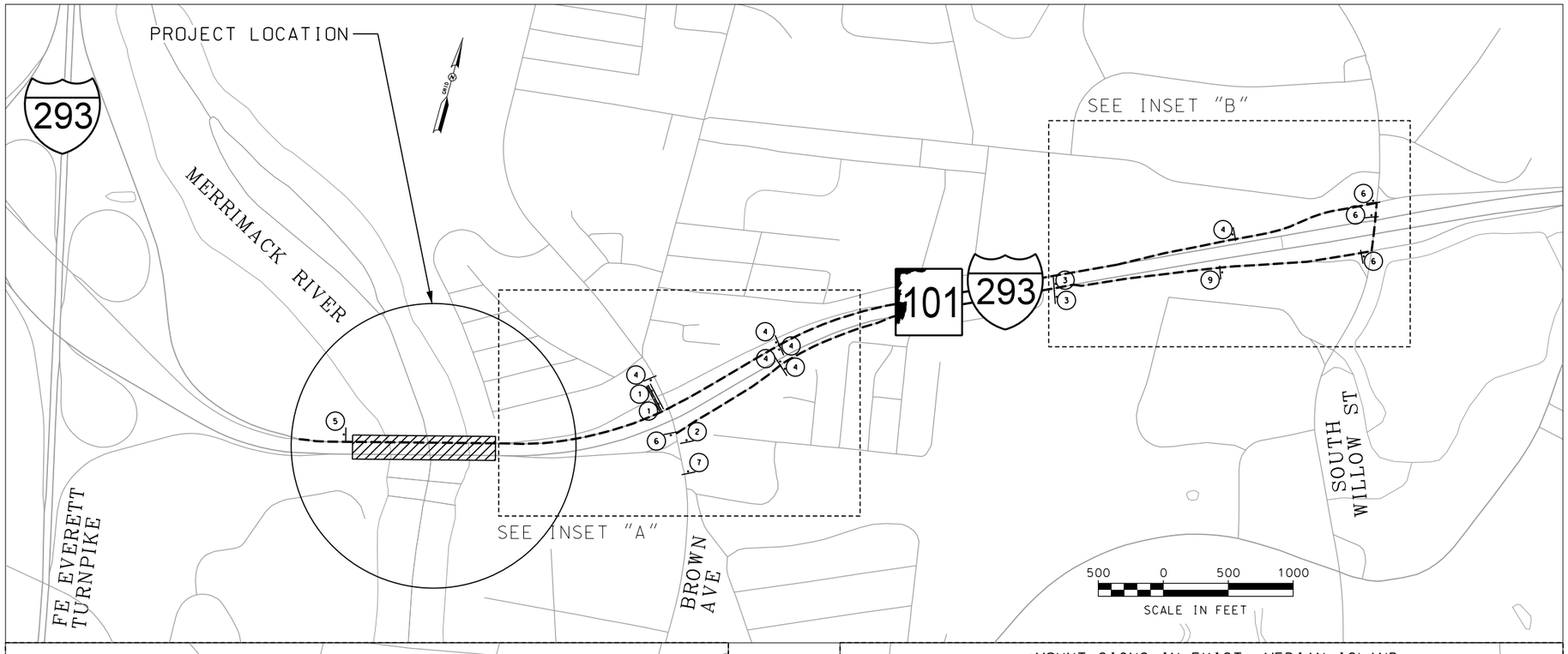
SDR PROCESSED	-	DATE -
NEW DESIGN	RDL	DATE 05/16/18
SHEET CHECKED	JPJ	DATE 05/16/18
AS BUILT DETAILS		DATE

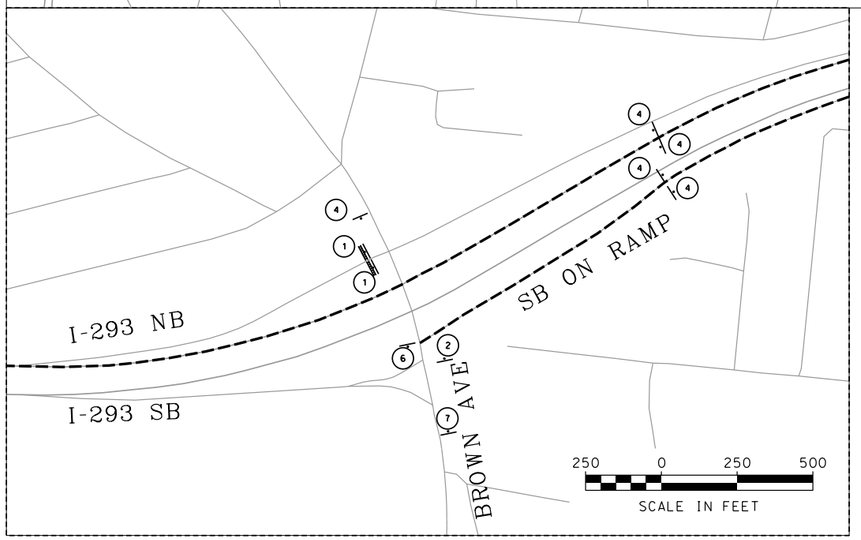
STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

TRAFFIC CONTROL PLANS PHASE 2

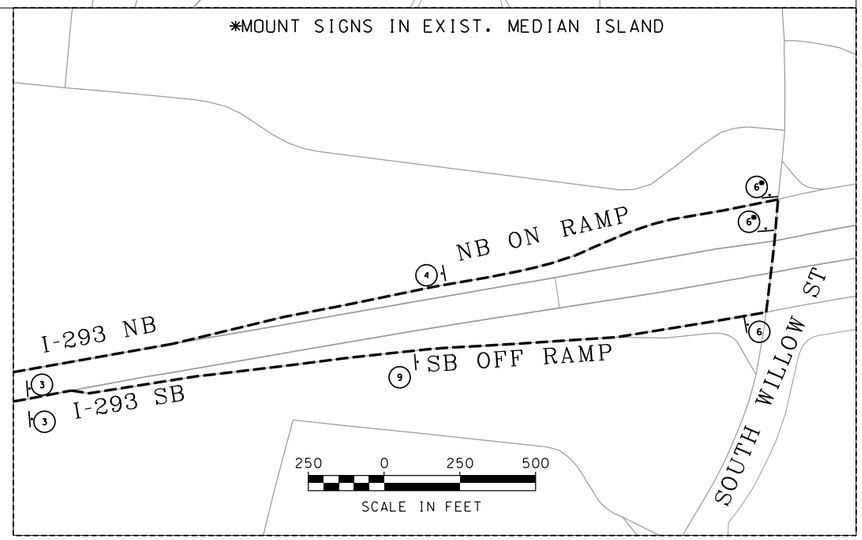
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731TTCP_PH 2	40731	33	46





INSET "A"

*MOUNT SIGNS IN EXIST. MEDIAN ISLAND



INSET "B"

NOTES:

1. THIS DETOUR IS INTENDED FOR THE CLOSURE OF THE I-293 NB ON RAMP FROM BROWN AVENUE AS REQUIRED FOR STAGED CONSTRUCTION.

2. THE CONTRACTOR SHALL SUBMIT A DETOUR PLAN, INCLUDING DURATION OF SETUP, FOR APPROVAL BY THE ENGINEER.

3. THE CONTRACTOR SHALL FURNISH AND ERECT DETOUR SIGNS PRIOR TO THE START OF ANY DETOUR. DETOUR SIGNS SHALL BE REMOVED OR COVERED WHEN DETOUR IS NOT IN USE. AS SHOWN ON INSETS A AND B, THE INTENT IS THAT FOR SIGNS SHOWN GRAPHICALLY SIDE BY SIDE, ONLY ONE SIGN IS VISIBLE FOR THE APPROPRIATE DETOUR. THE SIGNS SHALL BE LOCATED WITHIN THE AVAILABLE RIGHT-OF-WAY AND THE LOCATION OF SIGNS MAY BE ADJUSTED WITH APPROVAL FROM THE ENGINEER TO ACCOMPLISH THIS.

LEGEND

- DETOUR ROUTE
- SIGN LOCATION
- TYPE III BARRICADE LOCATION

1. RAMP CLOSED
   R11-2a
2. I-293 NB / DETOUR →
   SP-1
   M4-9R
3. I-293 NB / DETOUR →
   SP-1
   M4-9AR
   / USE EXIT 1
   SP-1
   M4-9R
   SP-5
4. I-293 NB / DETOUR ↑
   SP-1
   M4-9V
5. END DETOUR
   M4-8a
6. I-293 NB / DETOUR ←
   SP-1
   M4-9L
7. I-293 NB / DETOUR ↱
   SP-1
   M4-9AR
9. I-293 NB / DETOUR ↰
   SP-1
   M4-9AL
   SP-4
   / USE LEFT LANE

REVISIONS AFTER PROPOSAL

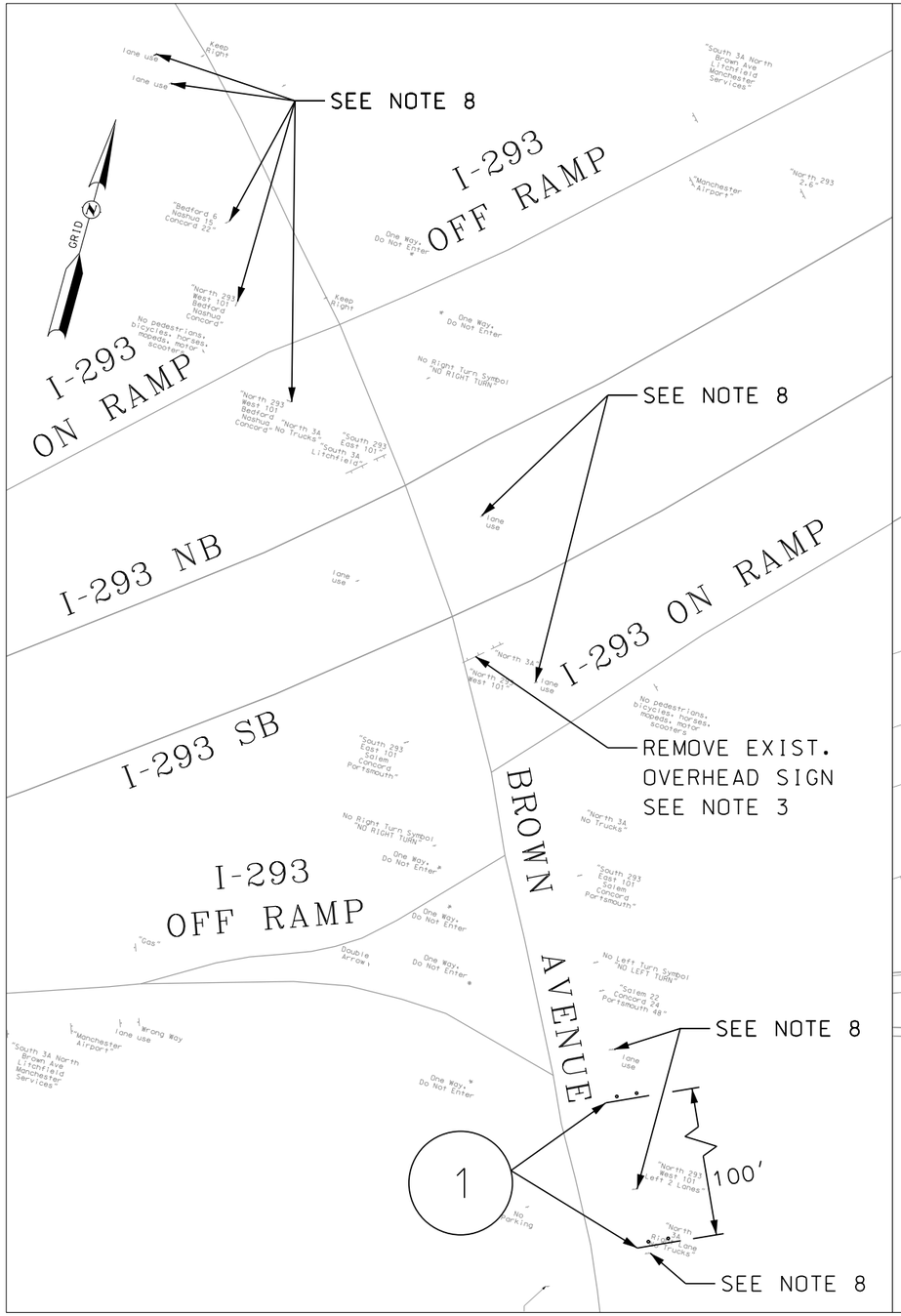
NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED - DATE -
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

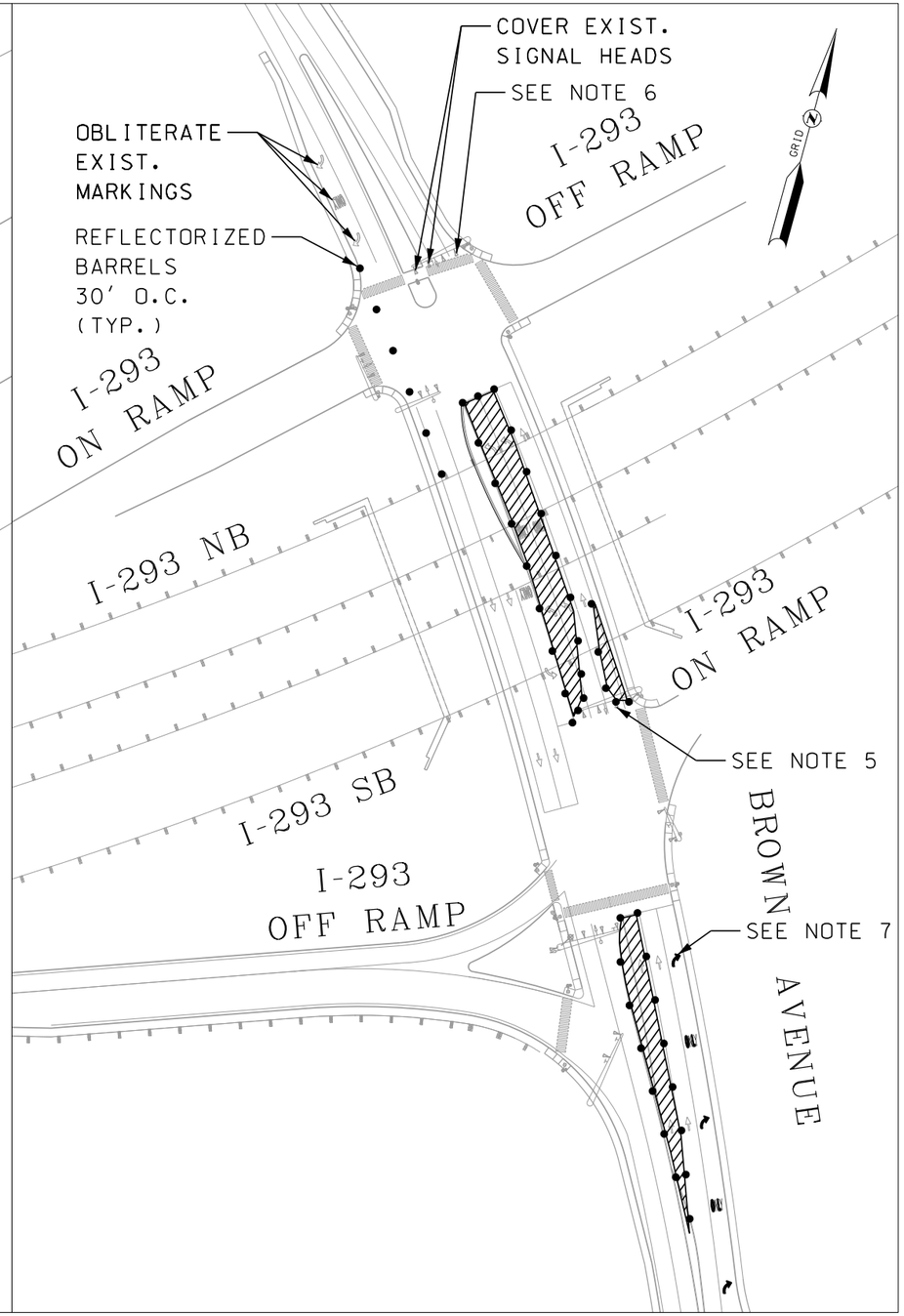
DETOUR PLAN
SHEET 1 OF 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731detour	40731	34	46



DETOUR SIGN MODIFICATIONS AT
BROWN AVENUE EXIT 2 INTERCHANGE

NOT TO SCALE



DETOUR LANE USE MODIFICATIONS AT
BROWN AVENUE EXIT 2 INTERCHANGE

NOT TO SCALE

NOTES:

1. THE MODIFICATION TO THE LANE USE AND EXISTING SIGNS SHALL COINCIDE WITH THE CLOSURE OF THE I-293 NB ON RAMP FROM BROWN AVENUE AS REQUIRED FOR STAGED CONSTRUCTION.

2. THIS PLAN DEPICTS THE INTENT TO USE BARRELS TO CLOSE TRAVEL LANES THAT WILL NOT BE UTILIZED WHILE THE DETOUR IS IN PLACE.

3. THE CONTRACTOR SHALL TAKE CARE WHEN REMOVING THE OVERHEAD SIGN TO AVOID DAMAGE TO THE SIGN. THE SIGN SHALL BE STORED IN A SAFE LOCATION TO BE APPROVED BY THE ENGINEER. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. ALL ASSOCIATED WORK NECESSARY TO REMOVE, STORE AND REINSTALL THE SIGN SHALL BE SUBSIDIARY TO ITEM 619.1 - MAINTENANCE OF TRAFFIC.

4. THE CONTRACTOR SHALL FURNISH AND ERECT DETOUR SIGNS PRIOR TO THE START OF ANY DETOUR. DETOUR SIGNS SHALL BE REMOVED OR COVERED WHEN DETOUR IS NOT IN USE. AS SHOWN ON INSETS A AND B (DETOUR PLAN SHEET 1 OF 2), THE INTENT IS THAT FOR SIGNS SHOWN GRAPHICALLY SIDE BY SIDE, ONLY ONE SIGN IS VISIBLE FOR THE APPROPRIATE DETOUR. THE SIGNS SHALL BE LOCATED WITHIN THE AVAILABLE RIGHT-OF-WAY AND LOCATION OF SIGNS MAY BE ADJUSTED WITH APPROVAL FROM THE ENGINEER TO ACCOMPLISH THIS.

5. THE CONTRACTOR SHALL MODIFY THE EXISTING EASTERNMOST MAST ARM MOUNTED SIGNAL HEAD AT THE I-293 SB RAMPS FOR THE BROWN AVENUE NB APPROACH. THE GREEN ARROW FOR THIS SIGNAL HEAD SHALL POINT TO THE RIGHT, DIRECTING BROWN AVENUE NB VEHICLES ONTO THE ON RAMP FOR I-293 SB. THIS WORK SHALL BE PAID FOR UNDER ITEM 616.191.

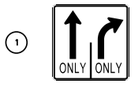
6. THE CONTRACTOR SHALL RELOCATE THE EXISTING EASTERNMOST MAST ARM MOUNTED SIGNAL HEAD AT THE I-293 NB RAMPS FOR THE BROWN AVENUE NB APPROACH. THE SIGNAL HEAD SHALL BE RELOCATED FROM THE MAST ARM TO THE POLE. THIS WORK SHALL BE PAID FOR UNDER ITEM 616.191.

7. THE CONTRACTOR SHALL IMPLEMENT THE PERMANENT LANE USE MODIFICATION ALONG THE BROWN AVENUE NB APPROACH TO THE I-293 SB ON RAMP AS SOON AS POSSIBLE IN THE CONTRACT AND WELL IN ADVANCE OF IMPLEMENTING THE PROJECT DETOUR.

8. THE CONTRACTOR SHALL COVER ANY SIGNS THAT CONFLICT WITH THE DETOUR CONFIGURATION.

LEGEND

- REFLECTORIZED DRUM
- PROP. SIGN LOCATION
- AREA CLOSED TO TRAFFIC



R3-8(35)

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED - DATE -
NEW DESIGN RDL DATE 05/16/18
SHEET CHECKED JPJ DATE 05/16/18
AS BUILT DETAILS DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

DETOUR PLAN
SHEET 2 OF 2

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731detour2	40731	35	46

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
619.1	G20-2a	48	24	END ROAD WORK	MUTCD STANDARD						4	8	32	X				2	BLACK/ORANGE
619.1	M4-8a	24	18	END DETOUR							1	3	3	X				1	BLACK/ORANGE
619.1	M4-9AL	48	36	DETOUR ←							1	12	12	X				2	BLACK/ORANGE
619.1	M4-9AR	48	36	DETOUR →							1	12	12	X				2	BLACK/ORANGE
619.1	M4-9L	48	36	DETOUR ←							4	12	48	X				2	BLACK/ORANGE
619.1	M4-9R	48	36	DETOUR →							3	12	36	X				2	BLACK/ORANGE
619.1	M4-9V	48	36	DETOUR ↑							6	12	72	X				2	BLACK/ORANGE
619.1	R11-2a	48	30	RAMP CLOSED							2	10	20						MOUNT ON TYPE III BARRICADE BLACK/ORANGE
619.1	R50-1	72	48	NH LAW WORK ZONE SPEEDING FINES $250 - $500							6	24	144	X				2	BLACK/WHITE
619.1	W1-4bR	48	48	↱↱							4	16	64	X				2	BLACK/ORANGE

ITEM #	IDENT #	SIGN SIZE WIDTH (inch)	SIGN SIZE HEIGHT (inch)	TEXT	TEXT DIMENSIONS LETTER HEIGHT (inch) UC	LC	CAPS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.) NOM AREA	SIGN AREA (SQ. FT.) TOTAL AREA	POSTS PER SIGN BREAKAWAY	STEEL I-BEAM	CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.	REMARKS
619.1	W1-4bL	48	48	↰↰	MUTCD STANDARD						4	16	64	X				2	BLACK/ORANGE
619.1	W4-5	48	48	↱							2	16	32	X				2	BLACK/ORANGE
619.1	R3-8(35)	30	30	ONLY ONLY							2	6.25	12.5	X				1	BLACK/WHITE
619.1	W20-1a	48	48	BRIDGE WORK AHEAD							2	16	32	X				2	BLACK/ORANGE
619.1	W20-1e	48	48	BRIDGE WORK 1/2 MILE							6	16	96	X				2	BLACK/ORANGE
619.1	W20-1f	48	48	BRIDGE WORK 1 MILE							6	16	96	X				2	BLACK/ORANGE
619.1	SP-1	48	12	I-293 NB			6D				15	4	60						MOUNT ABOVE M4-9R, M4-9V, M4-9L, M4-9AR, M4-9AL BLACK/ORANGE
619.1	SP-2	72	48	I-293 NB ON RAMP CLOSED FOLLOW DETOUR			6D 6D 6D 6D				3	24	72	X				2	BLACK/ORANGE
619.1	SP-4	78	12	USE LEFT LANE			6D				1	6.5	6.5						MOUNT BELOW M4-9AL BLACK/ORANGE
619.1	SP-5	60	12	USE EXIT 1			6D				2	5	10						MOUNT BELOW M4-9R BLACK/ORANGE

GENERAL NOTES

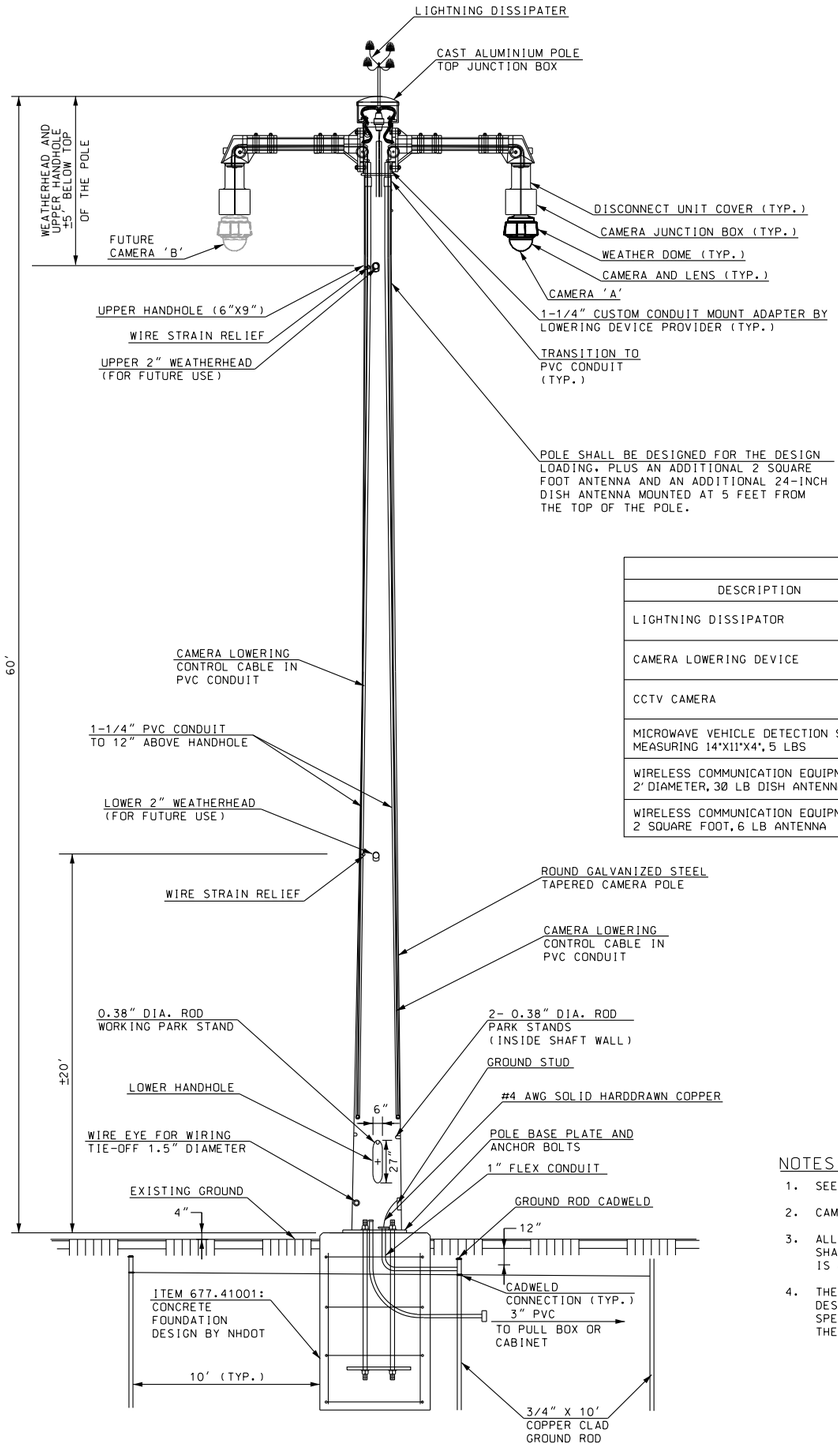
1. REFER TO THE 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION PUBLISHED BY THE NHDOT.
2. REFER TO THE LATEST EDITION OF THE STANDARD PLANS FOR ROAD CONSTRUCTION AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS AND NHDOT SPECIFIC SIGNS.
3. REFER TO THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS MANUAL AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
4. THE ALUMINUM OR U-CHANNEL POST SHALL BE FLUSH WITH THE TOP OF THE SIGN ON ALL SINGLE POST ASSEMBLIES.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF TRAFFIC

CONSTRUCTION SIGN SUMMARY

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
40731signsummary	40731	36	46



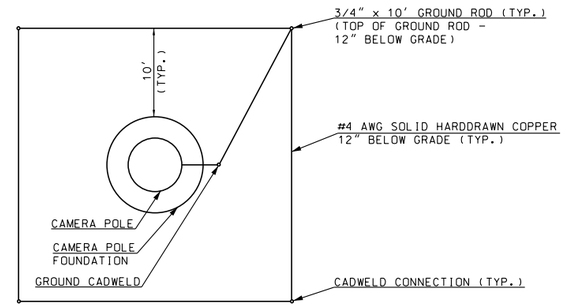
ITEM 677.4101 - CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM AND ITEM 677.41001 - CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM FOUNDATION

NOT TO SCALE

TABLE 1: POLE ATTACHMENTS		
DESCRIPTION	QUANTITY	NOTES / LOCATION
LIGHTNING DISSIPATOR	1	AS SHOWN IN CCTV DETAIL AND DESCRIBED IN SPECIAL PROVISIONS
CAMERA LOWERING DEVICE	2	AS SHOWN IN CCTV DETAIL AND DESCRIBED IN SPECIAL PROVISIONS; ONE INSTALLED BY OTHERS
CCTV CAMERA	2	AS SHOWN IN CCTV DETAIL AND DESCRIBED IN SPECIAL PROVISIONS; ONE INSTALLED BY OTHERS
MICROWAVE VEHICLE DETECTION SENSOR, MEASURING 14"X11"X4", 5 LBS	1	MOUNTING HEIGHT OF 26 FEET ABOVE ADJACENT ROADWAY. INSTALLED BY OTHERS.
WIRELESS COMMUNICATION EQUIPMENT, 2' DIAMETER, 30 LB DISH ANTENNA	1	MOUNTING HEIGHT WITHIN 5 FEET FROM TOP OF POLE. INSTALLED BY OTHERS.
WIRELESS COMMUNICATION EQUIPMENT, 2 SQUARE FOOT, 6 LB ANTENNA	1	MOUNTING HEIGHT WITHIN 5 FEET FROM TOP OF POLE. INSTALLED BY OTHERS.

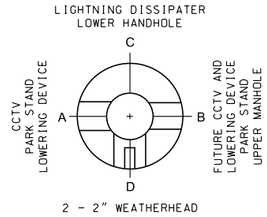
NOTES:

1. SEE GROUND ROD ARRAY DETAIL (THIS SHEET).
2. CAMERA WIRING INSIDE POLE NOT SHOWN.
3. ALL WEATHERHEADS, HANDHOLES, CONDUIT ACCESS POINTS SHALL BE FACTORY INSTALLED. NO FIELD DRILLING OF POLE IS ALLOWED.
4. THE PROPOSED CCTV SYSTEM POLE AND FOUNDATION SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE CCTV SYSTEM SPECIAL PROVISIONS AND TO ACCOMODATE INSTALLATION OF THE EQUIPMENT LISTED IN TABLE 1 ABOVE.



GROUND ROD ARRAY DETAIL

NOT TO SCALE



EQUIPMENT AXIS TOP VIEW

NOT TO SCALE

REVISIONS AFTER PROPOSAL			
DESCRIPTION	NUMBER	DATE	STATION
AS BUILT DETAILS		DATE	

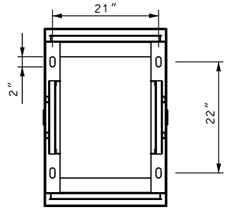
SDR PROCESSED	VHB	DATE 04-2018
NEW DESIGN	E. DREW	DATE 04-2018
SHEET CHECKED	M. SUENNEN	DATE 04-2018

STATE OF NEW HAMPSHIRE

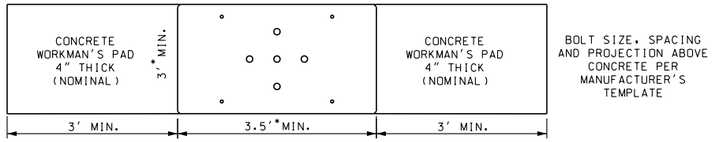
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

CCTV DETAILS (FOR GROUND MOUNTED CABINET)

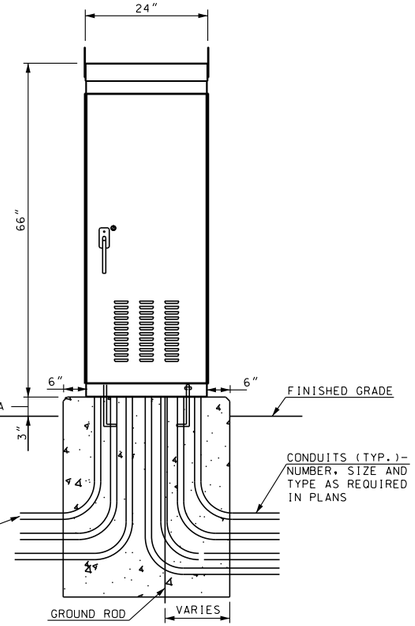
DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
5/7/2018	52525.17	CCTVDET2.dgn	40731	37	46



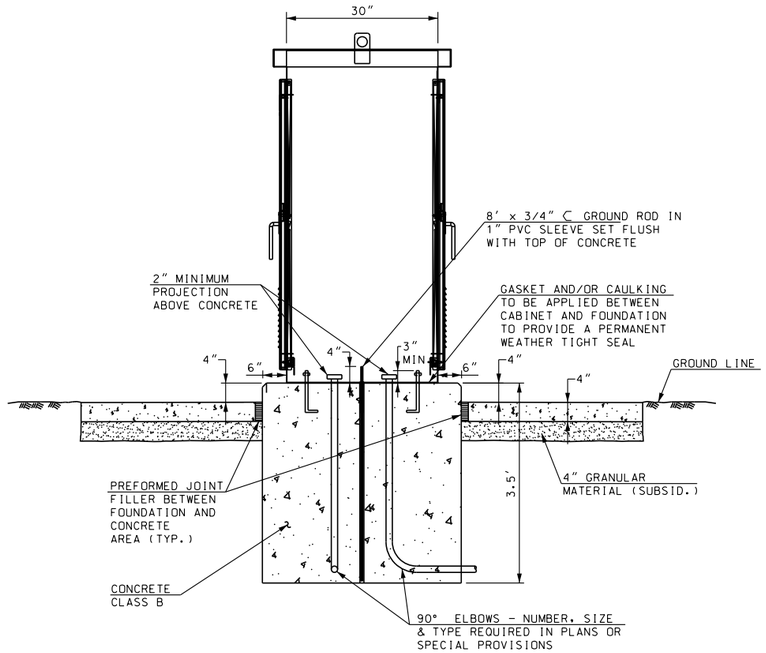
BOTTOM VIEW
(NO COMPONENTS)



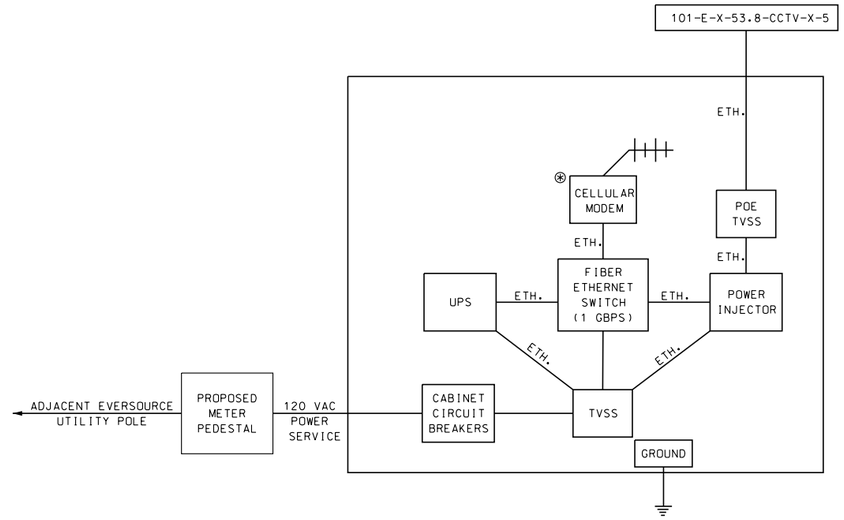
FOUNDATION PLAN



FRONT & REAR VIEWS



SECTION



GROUND MOUNTED ITS
EQUIPMENT CABINET DIAGRAM
FOR 101-E-X-53.8-CCTV-X-5
NOT TO SCALE

⊛ - CELLULAR MODEM SUBSIDIARY TO ITEM 677.54101 - GROUND MOUNTED ITS EQUIPMENT CABINET

ITEM 677.54101 - GROUND MOUNTED ITS EQUIPMENT CABINET DETAIL

NOT TO SCALE

NOTES:

1. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
2. WORKMAN'S PADS (AND CABINET DOORS) SHOULD BE ORIENTED AS SHOWN ON THE PLANS.
3. CONTRACTOR SHALL INSTALL A SPARE 3" PVC CONDUIT CAPPED 5 FEET FROM CABINET AT ALL GROUND MOUNTED LOCATIONS.
4. EXTERNAL HARDWARE AND ATTACHMENTS TO BE MOUNTED TO THE ITS CABINET SHALL BE MOUNTED AWAY FROM UNPROTECTED ROADWAYS.

LEGEND:

1 GBPS	- ONE GIGABIT PER SECOND
CCTV	- CLOSED CIRCUIT TELEVISION
ETH.	- ETHERNET CABLE
POE	- POWER OVER ETHERNET
UPS	- UNINTERRUPTIBLE POWER SUPPLY
TVSS	- TRANSIENT VOLTAGE AND SURGE SUPPRESSOR
VAC	- VOLTAGE IN ALTERNATING CURRENT

REVISIONS AFTER PROPOSAL

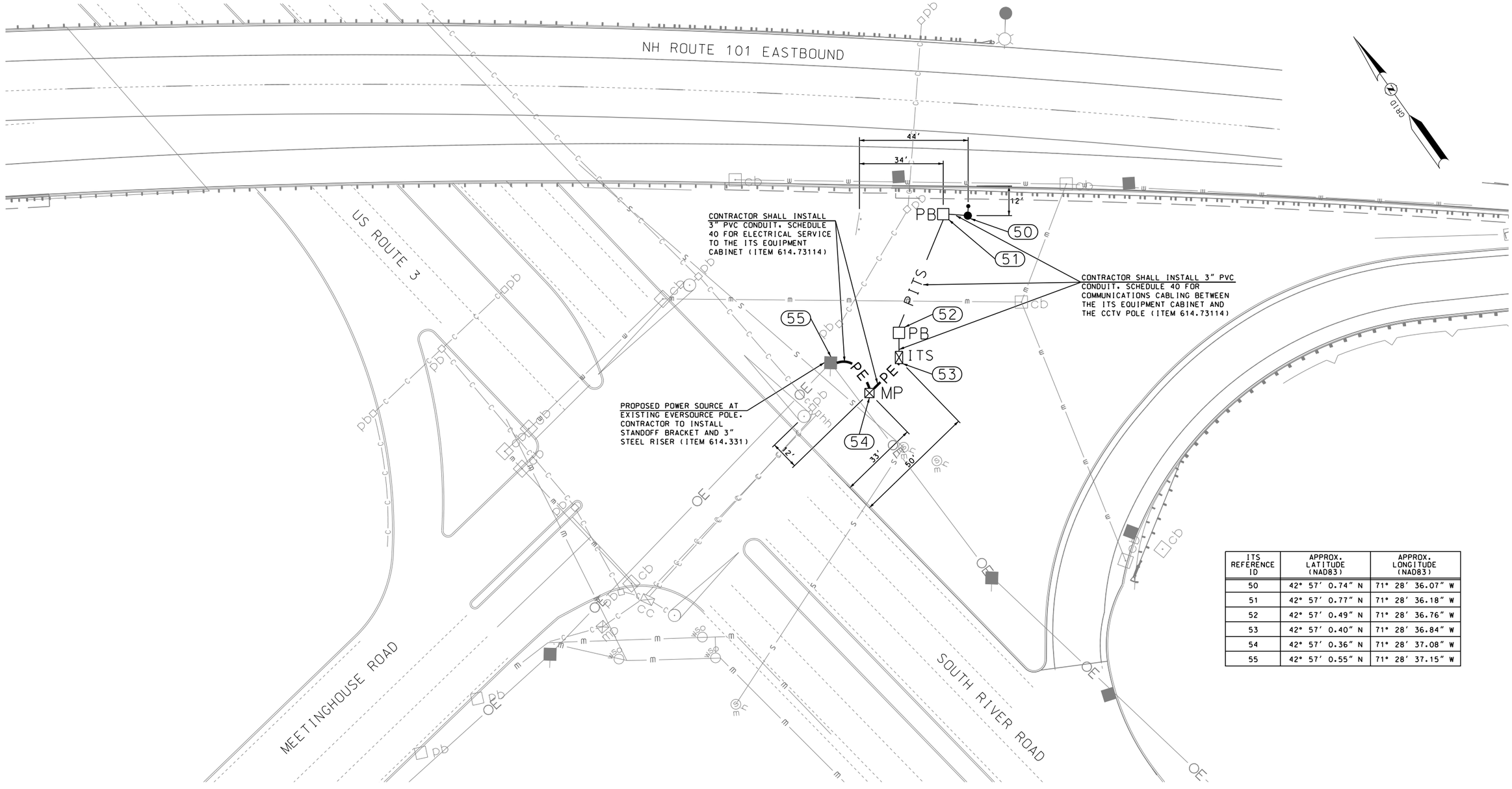
NUMBER	DESCRIPTION	STATION	DATE

SDR PROCESSED	VHB	DATE 04-2018
NEW DESIGN	E. DREW	DATE 04-2018
SHEET CHECKED	M. SUENNEN	DATE 04-2018
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

GROUND MOUNTED ITS EQUIPMENT CABINET DETAILS & COMMUNICATIONS SYSTEM DIAGRAM

DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
5/7/2018	52525.17	GMITSCAB.dgn	40731	38	46



ITS REFERENCE ID	APPROX. LATITUDE (NAD83)	APPROX. LONGITUDE (NAD83)
50	42° 57' 0.74" N	71° 28' 36.07" W
51	42° 57' 0.77" N	71° 28' 36.18" W
52	42° 57' 0.49" N	71° 28' 36.76" W
53	42° 57' 0.40" N	71° 28' 36.84" W
54	42° 57' 0.36" N	71° 28' 37.08" W
55	42° 57' 0.55" N	71° 28' 37.15" W

CONSTRUCTION NOTES:

1. CONTRACTOR SHALL REFER TO GROUND MOUNTED ITS EQUIPMENT CABINET DETAILS FOR CABINET DETAILS. THE GROUND MOUNTED ITS EQUIPMENT CABINET SHALL BE ITEM 677.54101.
2. CONTRACTOR SHALL REFER TO CCTV DETAILS (FOR GROUND MOUNTED CABINET) FOR POLE DESIGN. INSTALLATION. AND GROUNDING. THE CCTV POLE AND FOUNDATION ARE ITEMS 677.4101 AND 677.41001
3. COMMUNICATIONS FROM 101-E-X-53.8-CCTV-X-5 TO NHDOT TRANSPORTATION MANAGEMENT CENTER (TMC) SHALL BE CELLULAR. WITH CAPACITY FOR FUTURE WIRELESS COMMUNICATIONS ON BOTH THE CCTV POLE AND WITHIN THE ITS EQUIPMENT CABINET.
4. CONTRACTOR SHALL INSTALL APPROPRIATE EROSION CONTROL DEVICES ACCORDING TO THE CONTRACT'S POLLUTION PREVENTION CONTROL STRATEGIES PRIOR TO INITIATING RELATED TRENCHING AND EXCAVATION.
5. IN ANY PROPOSED CONDUIT WHERE ONLY ETHERNET CABLING WILL BE INSTALLED. CONTRACTOR SHALL INSTALL TRACER WIRE AND TRACER WIRE TERMINALS WHERE REQUIRED PER THE TRACER WIRE SPECIAL PROVISION.

UTILITY NOTES:

1. THE CONTRACTOR SHALL FOLLOW THE MOST RECENT EDITION OF EVERSOURCE ENERGY'S INFORMATION & REQUIREMENTS FOR ELECTRIC SUPPLY HANDBOOK FOR CONSTRUCTING ELECTRICAL SERVICE FOR 101-E-X-53.8-CCTV-X-5.
2. THE CONTRACTOR SHALL INSTALL A METER AND DISCONNECT PEDESTAL IN PROXIMITY TO EVERSOURCE UTILITY POLE AT THE INTERSECTION OF SOUTH RIVER ROAD (US ROUTE 3) AND MEETINGHOUSE ROAD. AS IDENTIFIED IN THE PLANS. POWER SERVICE SHALL BE 120 V. 100 AMP MINIMUM SERVICE AND THE PROPOSED METER AND DISCONNECT PEDESTAL SHALL BE PAID FOR UNDER 677.6301. INSTALLATION SHALL CONFORM TO CONSTRUCTION STANDARD DTR 54.116 OF THE EVERSOURCE HANDBOOK IDENTIFIED IN NOTE 1. ALL COSTS FOR THE METER PEDESTAL. BRANCH CIRCUIT BREAKERS. UTILITY SERVICE CHARGES. AND ACCESSORY EQUIPMENT REQUIRED BY EVERSOURCE SHALL BE SUBSIDIARY TO ITEM 677.6301.
3. THE CONTRACTOR SHALL INSTALL A 10 FOOT VERTICAL RISER WITH STANDOFF BRACKET AND 90 DEGREE UNDERGROUND SWEEP ON THE UTILITY POLE INDICATED IN THE PLAN. THIS INSTALLATION SHALL BE 3" STEEL CONDUIT (ITEM 614.331) AND GROUNDED AS SPECIFIED IN CONSTRUCTION STANDARDS DTR 12.017 AND DTR 12.057 OF THE EVERSOURCE HANDBOOK IDENTIFIED IN NOTE 1.
4. THE CONTRACTOR SHALL FOLLOW CONSTRUCTION STANDARD DTR 50.102 OF THE EVERSOURCE HANDBOOK IDENTIFIED IN NOTE 1 FOR ELECTRICAL SERVICE CONDUIT TRENCHING DETAIL. EVERSOURCE REQUIRES INSPECTION OF TRENCHING PRIOR TO BACKFILL BY THE CONTRACTOR.
5. THE EVERSOURCE WORK ORDER ASSOCIATED WITH SERVICING THIS INSTALLATION IS CRS SERVICE REQUEST NUMBER 3052035. THE EVERSOURCE FIELD TECHNICIAN ASSOCIATED WITH THIS WORK ORDER WAS ALAN LEBORGNE AT THE TIME OF THE DESIGN.

20 0 20 40
SCALE IN FEET

REVISIONS AFTER PROPOSAL	NUMBER	DATE	DESCRIPTION	STATION

SDR PROCESSED	VHB	DATE 04-2018
NEW DESIGN	E. DREW	DATE 04-2018
SHEET CHECKED	M. SUENNEN	DATE 04-2018
AS BUILT DETAILS		DATE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

ITS EQUIPMENT PLANS
101-E-X-53.8-CCTV-X-5

DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
5/7/2018	52525.17	CCTV-101.dgn	40731	39	46

ITEM 677.410XX (FOR ESTIMATING PURPOSES ONLY - NOT A FINAL DESIGN)

QUANTITIES					
ITEM NO.*	ITEM DESCRIPTION	UNIT	QUANTITY (BY SHAFT Ø)		
			3'-6"	4'-0"	4'-6"
520.1**	CONCRETE CLASS A	CY/FT	0.36	0.47	0.59
534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	1	1	1
544.**	REINFORCING STEEL	LB/FT	31.1	39.3	47.5

* ITEM NUMBERS ARE FOR SPECIFICATION REFERENCE ONLY. NO SEPARATE PAYMENT WILL BE MADE FOR THESE ITEMS.

** ITEM QUANTITY IS PER FOOT LENGTH OF DRILLED SHAFT.

GENERAL NOTES

1. THE FOUNDATION DESIGN IS BASED ON ESTIMATED POLE LOADS. SEE ITEM 677.410XX SPECIAL PROVISION FOR ESTIMATED SHAFT LENGTHS.

2. THE CONTRACTOR SHALL SUBMIT THE POLE DESIGN WITH LRFD DESIGN LOADS IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX. WHEN THE DESIGN LOADS ARE RECEIVED, NHDOT WILL VERIFY OR MODIFY THE ESTIMATED FOUNDATION DESIGN IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED. (2017) AS AMENDED.

3. THE CIRCULAR SHAFT FOUNDATION SHALL BE CONSTRUCTED IN A DRILLED HOLE IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX, AND THE CONTRACT PLANS. ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 677.410XX AND SHALL COMPLY WITH THE SPECIFICATIONS FOR THE FOLLOWING ITEMS, AS APPLICABLE:
   - ITEM 520.1, CONCRETE CLASS A
   - ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE)
   - ITEM 544, REINFORCING STEEL

4. WHERE FILL EMBANKMENT IS TO BE CONSTRUCTED ABOVE THE EXISTING GROUND, THE EMBANKMENT SHALL BE BUILT PRIOR TO CONSTRUCTING THE SHAFTS. PLACEMENT AND COMPACTION OF THE FILL SHALL BE IN ACCORDANCE WITH SECTION 203.

5. WHERE BEDROCK IS ENCOUNTERED WITHIN THE SPECIFIED SHAFT LENGTH, THE SHAFT SHALL EXTEND A MINIMUM OF 4 FEET INTO SOUND BEDROCK. IT IS NOT NECESSARY TO EXTEND THE SHAFT IN BEDROCK BEYOND THE SPECIFIED SOIL-BASED LENGTH GIVEN IN THE ITEM 677.410XX SPECIAL PROVISION.

6. THE FOUNDATION SHALL HAVE AN EXPOSED LENGTH NO GREATER THAN 4 INCHES MEASURED ON THE HIGH GROUND SIDE OF THE SHAFT.

7. ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31/M31M, GRADE 60 (420), AND SHALL HAVE CLEAR COVER AS NOTED ON DETAILS.

8. ANCHOR RODS SHALL BE IN ACCORDANCE WITH ITEM 677.410XX SPECIAL PROVISION. BENT (HOOKED OR J-BOLT) ANCHOR RODS SHALL NOT BE USED. THE EXPOSED LENGTH OF THE ANCHOR ROD BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE ROD DIAMETER (MAXIMUM) OR 1" (PREFERRED).

9. CAST-IN-PLACE CONCRETE SHALL BE IN ACCORDANCE WITH ITEM 677.410XX SPECIAL PROVISION. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR VISUAL INSPECTION OF THE REINFORCING BARS AND ANCHOR BOLTS PRIOR TO CONCRETE PLACEMENT.

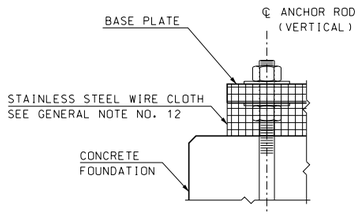
10. COAT ALL SURFACES OF THE DRILLED SHAFT TO 1'-0" BELOW FINISHED GRADE WITH WATER REPELLENT (SILANE-SILOXANE) IN ACCORDANCE WITH SECTION 534.

11. TRENCHES FOR THE CONDUITS SHALL BE HAND DUG NEAR THE PROPOSED FOUNDATION, DISTURBING AS LITTLE SOIL AS POSSIBLE IN PLACING OF THE CONDUITS (APPROXIMATELY 2.5 FT MAXIMUM DOWN FROM THE GROUND SURFACE). THE RESULTING TRENCHES SHALL BE BACKFILLED WITH STRUCTURAL FILL CONFORMING TO SECTION 508.

12. THE SCREEN SHALL BE STAINLESS STEEL STD. GR. WIRE CLOTH. 1/4" MAX OPENING WITH MIN. WIRE DIA. OF AWG NO. 16 WITH 2" LAP. SECURE WITH 3/4" STAINLESS STEEL BANDING AFTER ANCHOR RODS ARE FULLY TIGHTENED AND TESTED. NO GROUT SHALL BE PLACED BETWEEN FOUNDATION AND BOTTOM OF BASE PLATE.

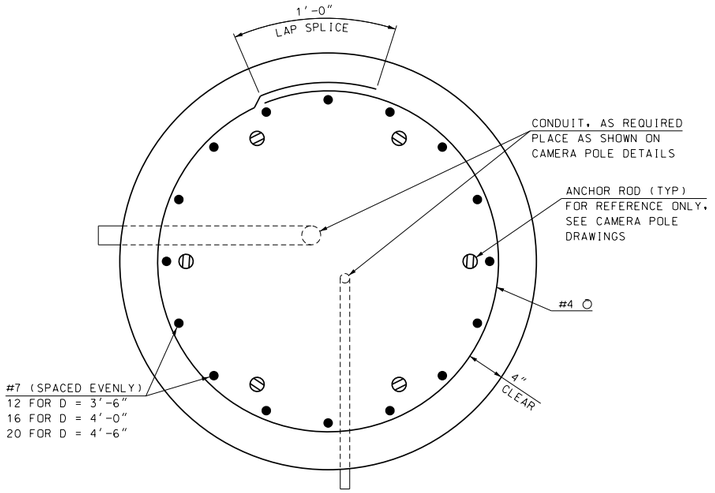
13. SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST ED. (2015) AS AMENDED; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED. (2017) AS AMENDED; NHDOT 2016 STANDARD SPECIFICATIONS AS AMENDED; AND THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX.

FOUNDATION SIZE	
POLE HEIGHT	SHAFT DIAMETER "D"
60'	3'-6"
65'	3'-6"
70'	4'-0"
75'	4'-0"
80'	4'-0"
85'	4'-6"
90'	4'-6"



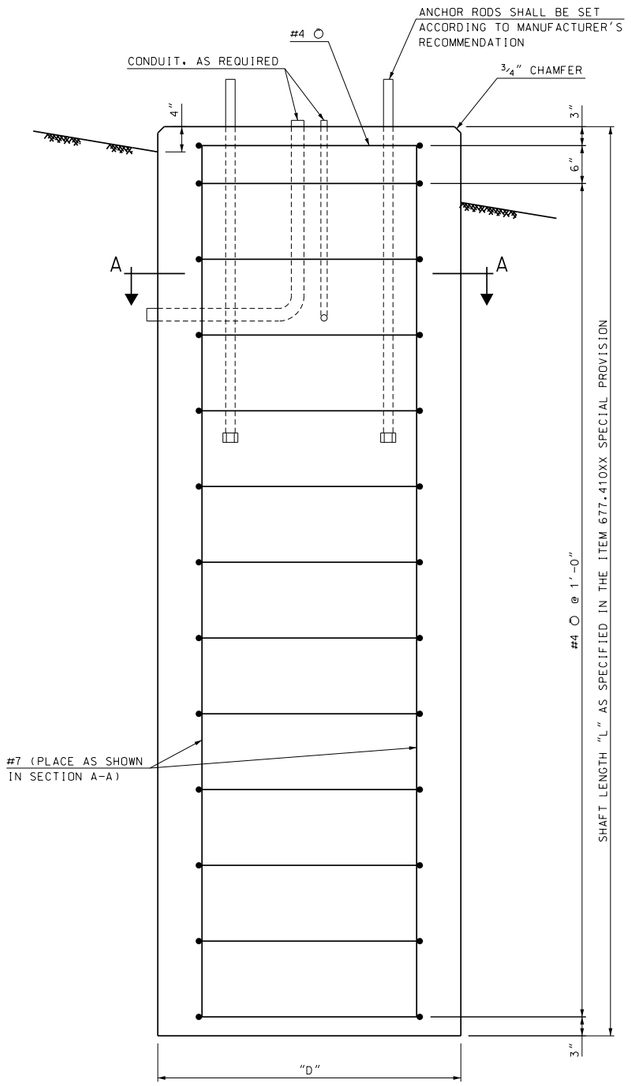
SCREEN DETAIL

NOT TO SCALE



SECTION A-A

SCALE: 1 1/2" = 1'-0"



ELEVATION

SCALE: 1" = 1'-0"

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD-MANCHESTER BRIDGE NO. STATE PROJECT 40731

LOCATION NH ROUTE 101 EB

CCTV POLE FOUNDATION - DRILLED SHAFT

BRIDGE SHEET - OF -

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	PAB	6/15	CHECKED	NHDOT	9/15
DRAWN	PAB	4/18	CHECKED	ANW	5/18
QUANTITIES	PAB	6/15	CHECKED	NHDOT	9/15

FILE NUMBER ------

SHEET SCALE AS NOTED

ISSUE DATE

REV. DATE

FEDERAL PROJECT NO.

SHEET NO. 40

TOTAL SHEETS 46

ITEM 677.410XX (FOR ESTIMATING PURPOSES ONLY - NOT A FINAL DESIGN)

FOUNDATION SIZE

POLE HEIGHT	FOOTING SIZE "B"	COLUMN DIAMETER "D"	COLUMN HEIGHT "H" BY GROUND SLOPE			
			LEVEL	4:1	3:1	2:1
60′	10′-6″	3′-0″	3′-10″	5′-7″	6′-1″	7′-3″
65′	11′-6″	3′-6″	3′-10″	5′-9″	6′-4″	7′-7″
70′	12′-6″	3′-6″	3′-10″	5′-10″	6′-6″	7′-10″
75′	12′-6″	3′-6″	3′-10″	5′-10″	6′-6″	7′-10″
80′	13′-6″	4′-0″	3′-10″	6′-1″	6′-9″	8′-3″
85′	13′-6″	4′-0″	3′-10″	6′-1″	6′-9″	8′-3″
90′	14′-6″	4′-0″	3′-10″	6′-2″	6′-11″	8′-6″

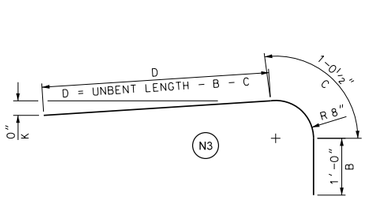
QUANTITIES

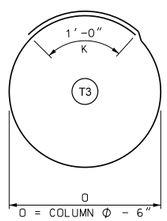
ITEM NO.*	ITEM DESCRIPTION	UNIT	QUANTITY (BY POLE HEIGHT AND GROUND SLOPE)																									
			60′				65′				70′				75′				80′				85′				90′			
			LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1	LEVEL	4:1	3:1	2:1
206.1	COMMON STRUCTURE EXCAVATION	CY	35	43	45	50	41	50	53	60	47	59	63	71	47	59	63	71	53	69	73	84	53	69	73	84	61	79	85	97
508.	STRUCTURAL FILL (1′ DEPTH)	CY	6	6	6	6	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	10	10	10	10
520.213	CONCRETE CLASS B, FOOTINGS (ON SOIL)	CY	7.1	7.6	7.7	8.0	8.7	9.4	9.6	10.0	10.0	10.8	11.0	11.5	10.0	10.8	11.0	11.5	11.9	13.0	13.3	14.0	11.9	13.0	13.3	14.0	13.5	14.6	14.9	15.6
534.3	WATER REPELLENT (SILANE-SILOXANE)	GAL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
544.	REINFORCING STEEL	LB	598	642	651	678	735	796	810	855	835	898	922	961	835	898	922	961	998	1088	1118	1175	998	1088	1118	1175	1115	1207	1240	1308

* ITEM NUMBERS ARE FOR SPECIFICATION REFERENCE ONLY. NO SEPARATE PAYMENT WILL BE MADE FOR THESE ITEMS, EXCEPT AS NOTED IN GENERAL NOTE #4.

GENERAL NOTES

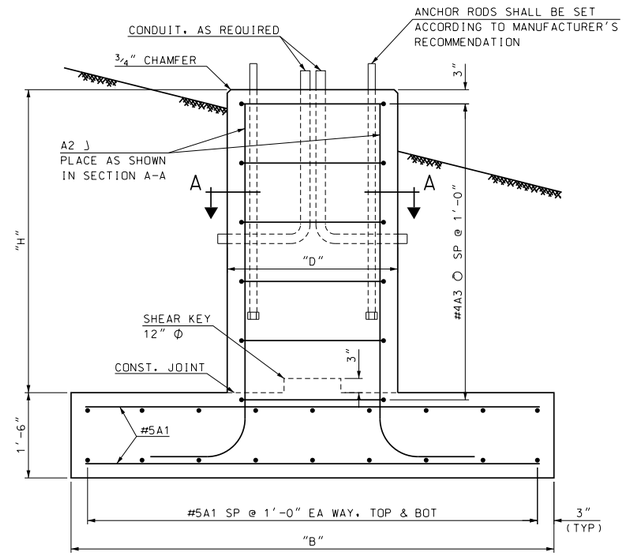
1. THE FOUNDATION DESIGN IS BASED ON ESTIMATED POLE LOADS. THE CONTRACTOR SHALL SUBMIT THE POLE DESIGN WITH LRFD DESIGN LOADS IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX. WHEN THE DESIGN LOADS ARE RECEIVED, NHDOT WILL VERIFY OR MODIFY THE ESTIMATED FOUNDATION DESIGN IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED. (2017) AS AMENDED.
2. THE SPREAD FOOTING FOUNDATION SHALL BE CONSTRUCTED IN AN EXCAVATED HOLE IN ACCORDANCE WITH THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX, AND THE CONTRACT PLANS. ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 677.410XX EXCEPT AS NOTED IN NOTE #4. ALL WORK AND MATERIALS SHALL COMPLY WITH THE SPECIFICATIONS FOR THE APPLICABLE ITEMS.
3. BEARING RESISTANCE IS BASED ON LOAD AND RESISTANCE FACTOR DESIGN (LRFD). THE NOMINAL BEARING RESISTANCE IS 4.5 TONS/SF WITH A RESISTANCE FACTOR OF 0.45.
4. FOOTING CONCRETE SHALL BE PLACED ON A 1′-0″ LAYER OF STRUCTURAL FILL AS SHOWN ON THE PLANS, SUBSIDIARY TO ITEM 677.410XX. UNSUITABLE MATERIAL FOUND AT A DEPTH GREATER THAN 1′-0″ BELOW THE PROPOSED BOTTOM OF FOOTING ELEVATION SHALL BE REMOVED AND REPLACED WITH STRUCTURAL FILL AS DIRECTED BY THE ENGINEER, PAID UNDER ITEMS 206.1 AND 508. ALL STRUCTURAL FILL SHALL BE PLACED IN ACCORDANCE WITH SECTION 508.
5. THE COLUMN SHALL HAVE AN EXPOSED LENGTH NO GREATER THAN 4 INCHES MEASURED ON THE HIGH GROUND SIDE OF THE SHAFT, AND THE SPREAD FOOTING SHALL HAVE A MINIMUM EMBEDMENT DEPTH OF 5′-0″.
6. ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M31/M31M, GRADE 60 (420). ALL REINFORCING STEEL SHALL HAVE A MINIMUM CLEAR COVER OF 3″.
7. ANCHOR RODS SHALL BE IN ACCORDANCE WITH ITEM 677.410XX SPECIAL PROVISION. BENT (HOOKED OR J-BOLT) ANCHOR RODS SHALL NOT BE USED. THE EXPOSED LENGTH OF THE ANCHOR RODS BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE ROD DIAMETER (MAXIMUM) OR 1″ (PREFERRED).
8. CAST-IN-PLACE CONCRETE SHALL BE IN ACCORDANCE WITH ITEM 677.410XX SPECIAL PROVISION. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR VISUAL INSPECTION OF THE EXCAVATION, INCLUDING THE ARRANGEMENT OF THE REINFORCING BARS AND ANCHOR BOLTS, PRIOR TO CONCRETE PLACEMENT.
9. COAT ALL SURFACES OF THE CONCRETE COLUMN TO 1′-0″ BELOW FINISHED GRADE WITH WATER REPELLENT (SILANE-SILOXANE) IN ACCORDANCE WITH SECTION 534.
10. TRENCHES FOR THE CONDUITS SHALL BE HAND DUG NEAR THE PROPOSED FOUNDATION, DISTURBING AS LITTLE SOIL AS POSSIBLE IN PLACING OF THE CONDUITS (APPROXIMATELY 2.5 FT MAXIMUM DOWN FROM THE GROUND SURFACE). THE RESULTING TRENCHES SHALL BE BACKFILLED WITH STRUCTURAL FILL CONFORMING TO SECTION 508.
11. THE SCREEN SHALL BE STAINLESS STEEL STD. GR. WIRE CLOTH. 1/4″ MAX OPENING WITH MIN. WIRE DIA. OF AWG NO. 16 WITH 2″ LAP. SECURE WITH 3/4″ STAINLESS STEEL BANDING AFTER ANCHOR RODS ARE FULLY TIGHTENED AND TESTED. NO GROUT SHALL BE PLACED BETWEEN FOUNDATION AND BOTTOM OF BASE PLATE.
12. SPECIFICATIONS: AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST ED. (2015) AS AMENDED; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH ED. (2017) AS AMENDED; NHDOT 2016 STANDARD SPECIFICATIONS AS AMENDED; AND THE SPECIAL PROVISION FOR ITEMS 677.41XX AND 677.410XX.





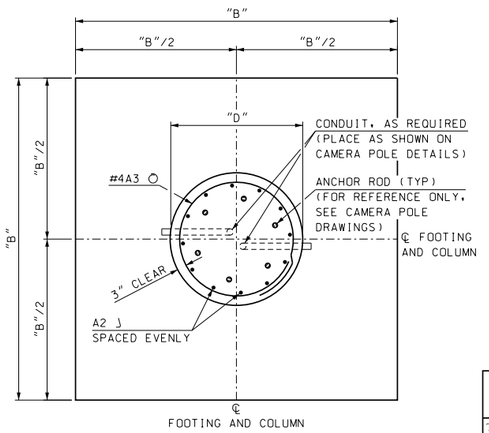
REINFORCING SCHEDULE

POLE HEIGHT	GROUND SLOPE	MARK	TYPE	BAR #	NO. OF BARS	UNBENT LENGTH
60′	ALL	A1	—	#5	44	10′-0″
	LEVEL	A2	N3	#6	12	6′-1″
		A3	T3	#4	5	8′-11″
	4:1	A2	N3	#6	12	7′-10″
		A3	T3	#4	7	8′-11″
	3:1	A2	N3	#6	12	8′-4″
		A3	T3	#4	7	8′-11″
	2:1	A2	N3	#6	12	9′-6″
		A3	T3	#4	8	8′-11″
65′	ALL	A1	—	#5	48	11′-0″
	LEVEL	A2	N3	#7	12	6′-1″
		A3	T3	#4	5	10′-6″
	4:1	A2	N3	#7	12	8′-0″
		A3	T3	#4	7	10′-6″
	3:1	A2	N3	#7	12	8′-7″
		A3	T3	#4	7	10′-6″
	2:1	A2	N3	#7	12	9′-10″
		A3	T3	#4	9	10′-6″
70′	ALL	A1	—	#5	52	12′-0″
	LEVEL	A2	N3	#7	12	6′-1″
		A3	T3	#4	5	10′-6″
	4:1	A2	N3	#7	12	8′-1″
		A3	T3	#4	7	10′-6″
	3:1	A2	N3	#7	12	8′-9″
		A3	T3	#4	8	10′-6″
	2:1	A2	N3	#7	12	10′-1″
		A3	T3	#4	9	10′-6″
75′	ALL	A1	—	#5	52	12′-0″
	LEVEL	A2	N3	#7	12	6′-1″
		A3	T3	#4	5	10′-6″
	4:1	A2	N3	#7	12	8′-1″
		A3	T3	#4	7	10′-6″
	3:1	A2	N3	#7	12	8′-9″
		A3	T3	#4	8	10′-6″
	2:1	A2	N3	#7	12	10′-1″
		A3	T3	#4	9	10′-6″
80′	ALL	A1	—	#5	56	13′-0″
	LEVEL	A2	N3	#7	16	6′-1″
		A3	T3	#4	5	12′-0″
	4:1	A2	N3	#7	16	8′-4″
		A3	T3	#4	7	12′-0″
	3:1	A2	N3	#7	16	9′-0″
		A3	T3	#4	8	12′-0″
	2:1	A2	N3	#7	16	10′-6″
		A3	T3	#4	9	12′-0″
85′	ALL	A1	—	#5	56	13′-0″
	LEVEL	A2	N3	#7	16	6′-1″
		A3	T3	#4	5	12′-0″
	4:1	A2	N3	#7	16	8′-4″
		A3	T3	#4	7	12′-0″
	3:1	A2	N3	#7	16	9′-0″
		A3	T3	#4	8	12′-0″
	2:1	A2	N3	#7	16	10′-6″
		A3	T3	#4	9	12′-0″
90′	ALL	A1	—	#5	60	14′-0″
	LEVEL	A2	N3	#7	16	6′-1″
		A3	T3	#4	5	12′-0″
	4:1	A2	N3	#7	16	8′-5″
		A3	T3	#4	7	12′-0″
	3:1	A2	N3	#7	16	9′-2″
		A3	T3	#4	8	12′-0″
	2:1	A2	N3	#7	16	10′-9″
		A3	T3	#4	9	12′-0″



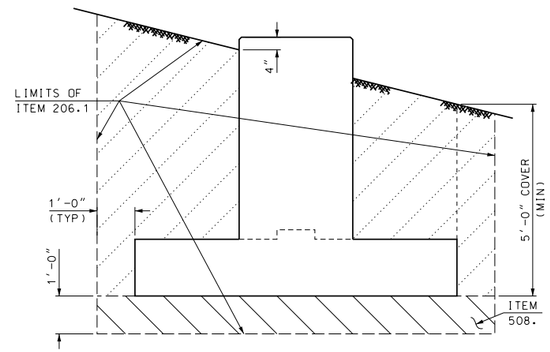
MASONRY AND REINFORCING ELEVATION

SCALE: 3/4″ = 1′-0″



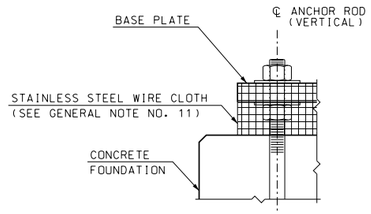
SECTION A-A

SCALE: 1/2″ = 1′-0″



EARTHWORK ELEVATION

SCALE: 1/2″ = 1′-0″



SCREEN DETAIL

NOT TO SCALE

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD-MANCHESTER BRIDGE NO. STATE PROJECT 40731

LOCATION NH ROUTE 101 EB

CCTV POLE FOUNDATION - SPREAD FOOTING

BRIDGE SHEET - OF -

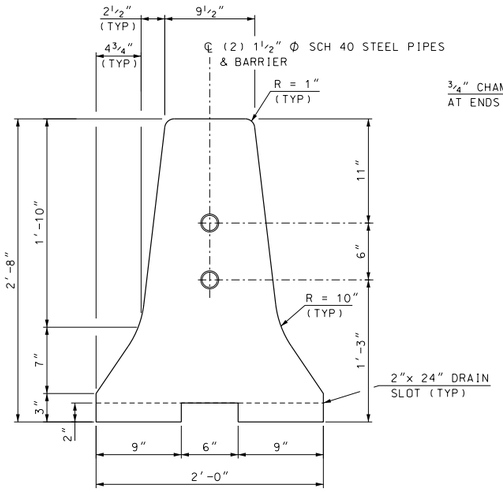
FILE NUMBER ------

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	PAB	4/18	CHECKED	ANW	5/18
	DRAWN	PAB	4/18	CHECKED	ANW	5/18
	QUANTITIES	PAB	4/18	CHECKED	ANW	5/18
	ISSUE DATE			FEDERAL PROJECT NO.		
	REV. DATE					

SHEET SCALE: AS NOTED

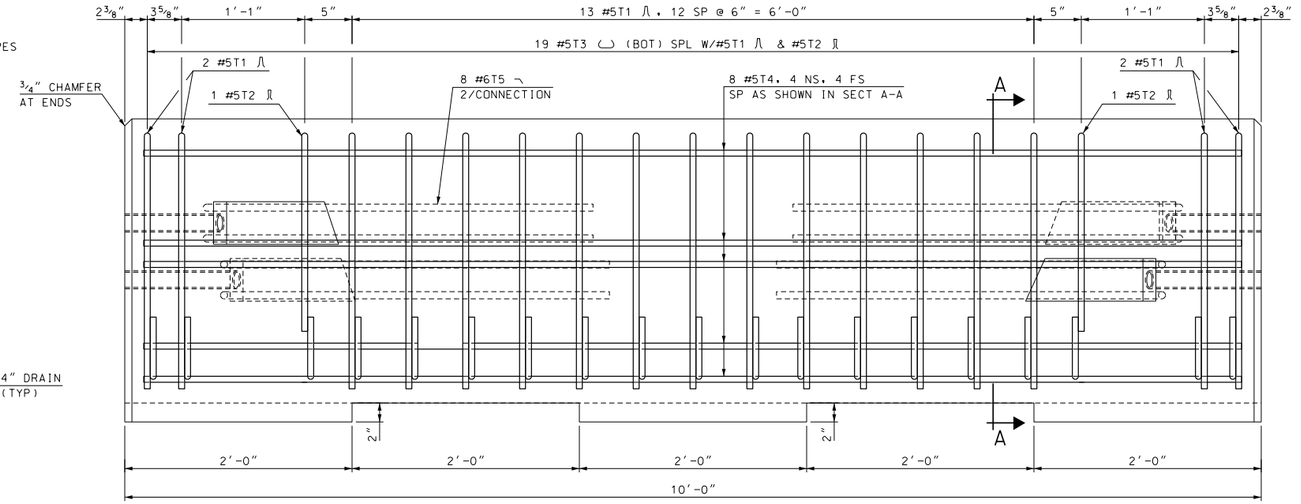
SHEET NO. 41

TOTAL SHEETS 46



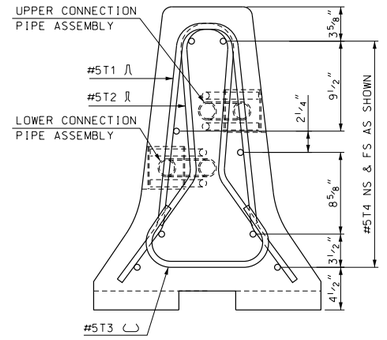
END VIEW

SCALE: 1 1/2" = 1'-0"



ELEVATION

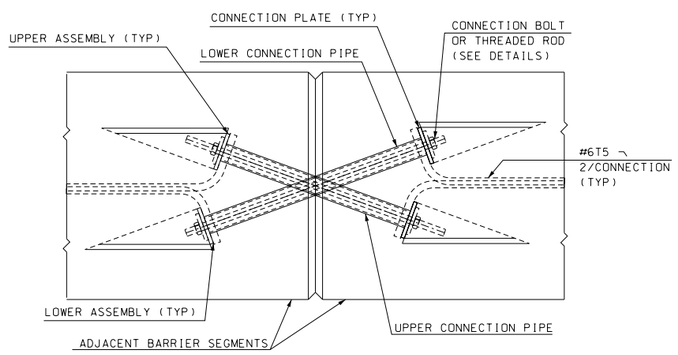
SCALE: 1 1/2" = 1'-0"



SECTION A-A

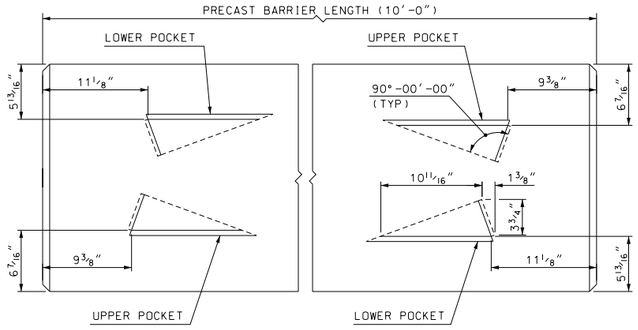
SCALE: 1 1/2" = 1'-0"

NOTE: CONNECTION HARDWARE SHALL NOT EXTEND BEYOND THE CONCRETE FACE OF BARRIER



TYPE X JOINT CONNECTION DETAILS

SCALE: 1 1/2" = 1'-0"



TOP VIEW CONNECTION POCKETS

SCALE: 1 1/2" = 1'-0"

GENERAL NOTES:

1. PORTABLE CONCRETE BARRIER SHALL BE FURNISHED BY THE CONTRACTOR AND PAID FOR AS ITEM 606.41741, PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE). CONCRETE BARRIER AND ALL ATTACHMENTS SHALL BE FABRICATED IN ACCORDANCE WITH SPECIAL PROVISIONS. ALL BARRIER UNITS SHALL BE 10' LONG.
2. PORTABLE CONCRETE BARRIER DETAILS, AS SHOWN ON THESE PLANS, ARE IN COMPLIANCE WITH REQUIREMENTS PER UPDATED NCHRP REPORT 350 FOR TEST NO 3-11 (MASH TEST LEVEL 3), CRASH TESTED BY TEXAS A&M UNIVERSITY SYSTEM, MAY 2005, AND ACCEPTED PER REPORT FHWA/TX-05/0-4692-1.
3. THE BARRIER HAS BEEN CRASH TESTED WITH A 27" DYNAMIC DEFLECTION WHICH WILL ALLOW THE BARRIER TO BE PLACED A MINIMUM 12" FROM THE EDGE OF THE DECK.
4. USAGE OF THE TEXAS X-BOLT BARRIER REQUIRES A MINIMUM OF 100 LINEAR FEET (10 - 10' UNITS). THE X-BOLT BARRIER SHALL EXTEND A MINIMUM OF 50' BEYOND THE BRIDGE AT EACH END, PARALLEL TO THE ROADWAY CENTERLINE. THE ENDS OF THE BARRIER SHALL CONNECT TO THE TRANSITION UNIT AND THEN TO NHDOT PCB FLARED OUT THE REQUIRED CLEAR ZONE AS SHOWN ON SHEET 2 OF 3.
5. THE CONNECTION BOLTS AT THE BARRIER JOINTS SHALL BE TIGHTENED TO THE "TURN OF THE NUT" METHOD IN ACCORDANCE WITH SECTION 550.3.11.6.4 OF NHDOT STANDARD SPECIFICATIONS. AFTER INSTALLATION, ALL X-BOLT JOINTS SHALL BE CHECKED BY THE CONTRACT ADMINISTRATOR CONFIRMING THEY MEET THE TIGHTENED REQUIREMENT.
6. THE TEXAS X-BOLT BARRIER MAY BE INSTALLED WITH A 125' MINIMUM RADIUS OF CURVATURE AND A RELATIVE ANGLE OF 4 DEGREES BETWEEN THE 10' UNITS.
7. THE CONTRACTOR SHALL FURNISH AND INSTALL APPROVED RETROREFLECTIVE DELINEATORS AT 25-FOOT INTERVALS ALONG TOP AND/OR ONE FOOT DOWN THE SIDE OF PORTABLE CONCRETE BARRIER, SUBSIDIARY TO ITEM 606.41741 (SEE STANDARD NO. DL-1 OF NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION). THE COLOR OF THE DELINEATORS SHALL, IN ALL INSTANCES, CONFORM TO THE COLOR OF THE EDGE LINE MARKINGS. DELINEATOR SUPPLEMENT, BUT DO NOT REPLACE, THE NEED FOR RETROREFLECTIVE SOLID EDGE LINE MARKINGS.

MATERIAL NOTES:

1. BARRIERS SHALL BE LIGHT COLORED CLASS AA CONCRETE, WITH COMPRESSIVE STRENGTH OF 4000 psi, AND SHALL HAVE A SMOOTH UNIFORM SURFACE FREE OF DEFECTS AND IRREGULARITIES. CASTING DATE SHALL BE SHOWN ON BARRIER. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.
2. ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615) GRADE 60. ALL REINFORCEMENT SHALL HAVE 1 3/4" MINIMUM CLEAR COVER, UNLESS OTHERWISE NOTED.
3. CONNECTION BOLTS SHALL BE 7/8" Φ GALVANIZED HIGH STRENGTH THREADED RODS CONFORMING TO ASTM A325. STEEL PIPES, PLATE WASHERS, AND CONNECTION PLATES SHALL BE GALVANIZED ASTM A36 STEEL.
4. ALL STEEL FOR CONNECTIONS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

BARRIER WEIGHT APPROX. 2.38 TONS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

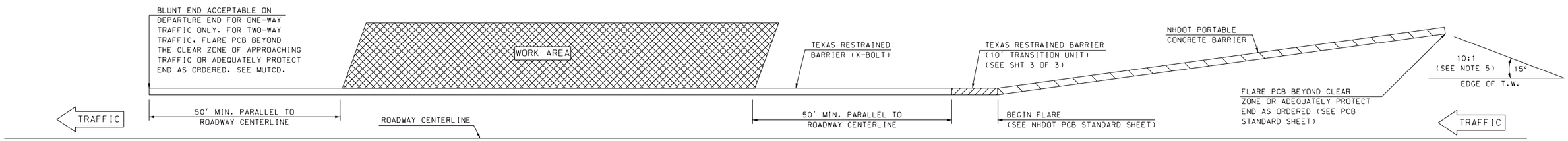
TEXAS RESTRAINED BARRIER (X-BOLT) (1 OF 3)

BRIDGE SHEET - OF -

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
	DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
	QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
	ISSUE DATE	5/15/18	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		----------		42	46

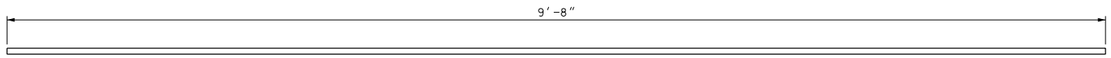
FILE NUMBER 8-1-1

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED



PLAN - BARRIER LAYOUT

(NTS)



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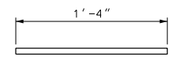

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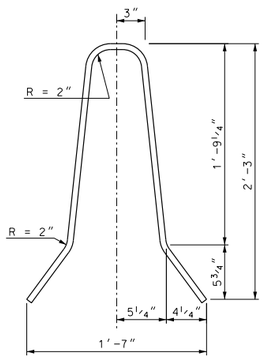

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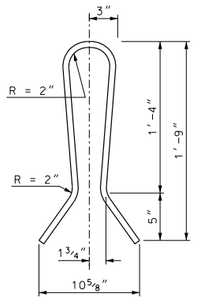

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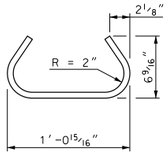

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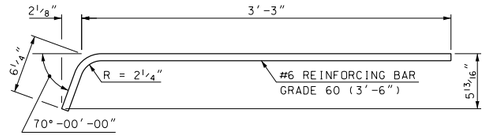
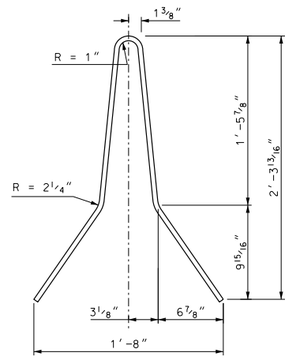
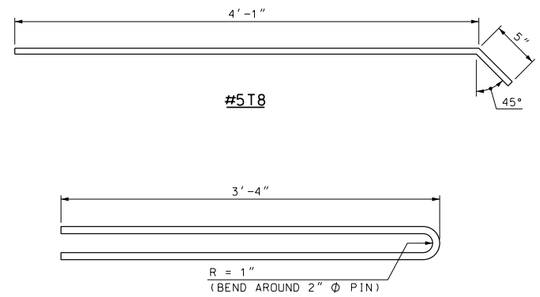


#6T5 ⌐



#4T6

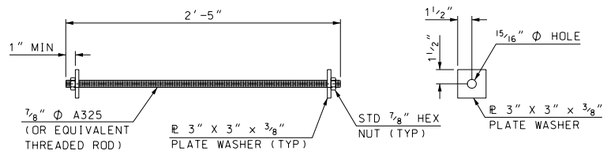


#5T8

#6T9

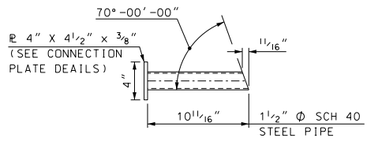
BENDING SCHEDULE

SCALE: 1½" = 1'-0"



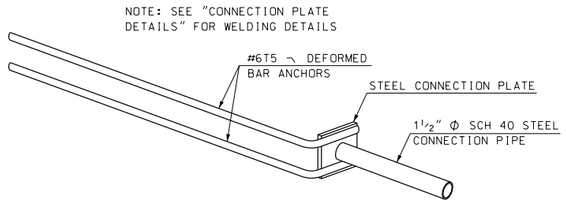
CONNECTION BOLT OR THREADED ROD DETAILS

SCALE: 1½" = 1'-0"



UPPER CONNECTION PIPE DETAIL

SCALE: 1½" = 1'-0"



ISOMETRIC VIEW OF TYPICAL WELD ASSEMBLY

SCALE: N.T.S.

REBAR SCHEDULE TEXAS X-BOLT (10' BARRIER)			
MK		QTY	LENGTH
T1	#5	17	5'-2"
T2	#5	2	4'-0"
T3	#5	19	2'-1"
T4	#5	8	9'-8"
T5	#6	8	3'-9"

REBAR SCHEDULE TRANSITION (10' BARRIER)			
MK		QTY	LENGTH
T1	#5	9	5'-2"
T2	#5	1	4'-0"
T3	#5	10	2'-1"
T4	#5	8	9'-8"
T5	#6	4	3'-9"
T6	#4	4	5'-2"
T7	#5	4	1'-4"
T8	#5	2	4'-6"
T9	#6	3	6'-10"

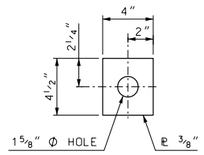
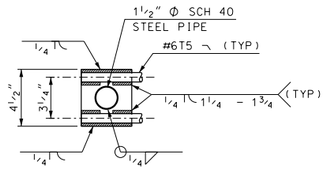


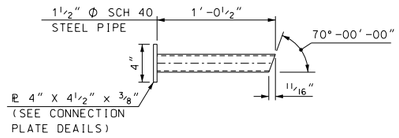
PLATE DIMENSIONS



WELDING DETAILS

CONNECTION PLATE DETAILS

SCALE: 2" = 1'-0"



LOWER CONNECTION PIPE DETAIL

SCALE: 1½" = 1'-0"

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

TEXAS RESTRAINED BARRIER (X-BOLT) (2 OF 3)

BRIDGE SHEET - OF -

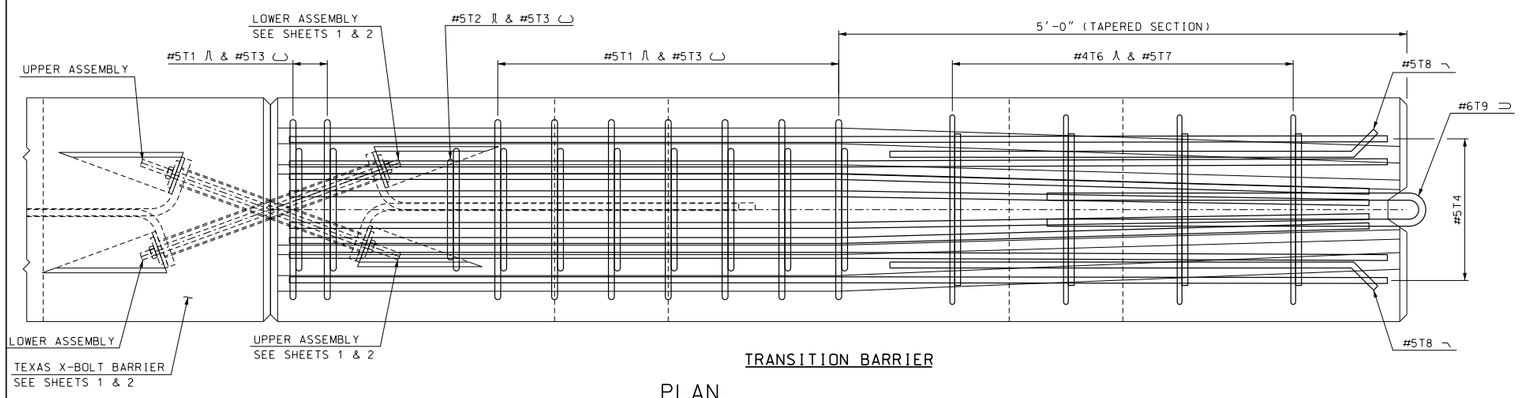
REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
	DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
	QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
	ISSUE DATE	5/15/18		FEDERAL PROJECT NO.		
	REV. DATE			----------		

FILE NUMBER 8-1-1

SHEET NO. 43

TOTAL SHEETS 46

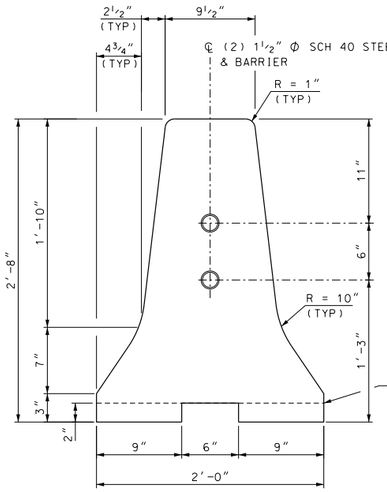
SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED



TRANSITION BARRIER

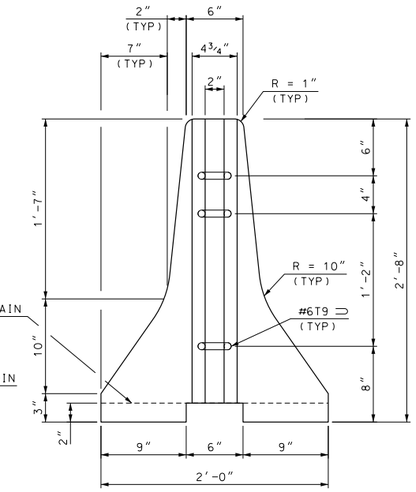
PLAN

SCALE: 1½" = 1'-0"



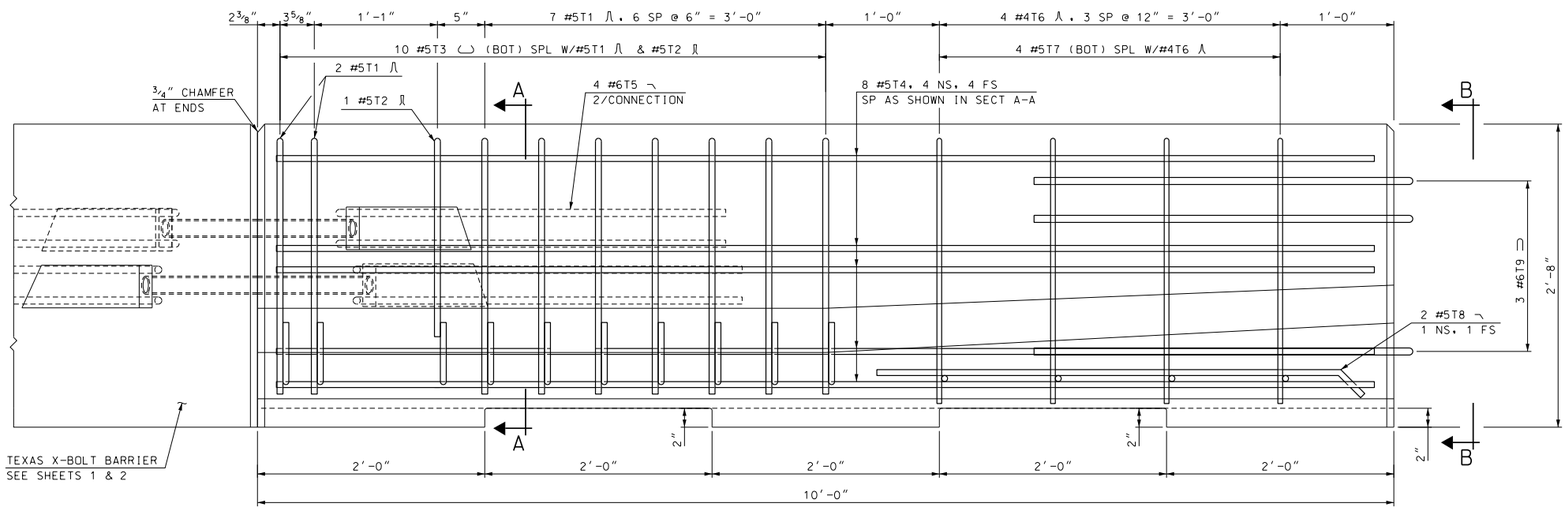
END VIEW SECTION A-A

SCALE: 1½" = 1'-0"



VIEW B-B

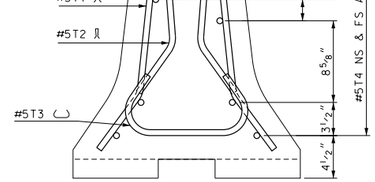
SCALE: 1½" = 1'-0"



TRANSITION BARRIER

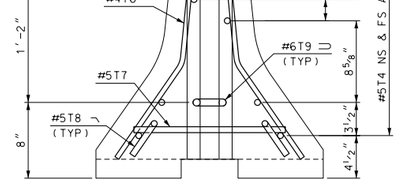
ELEVATION

SCALE: 1½" = 1'-0"



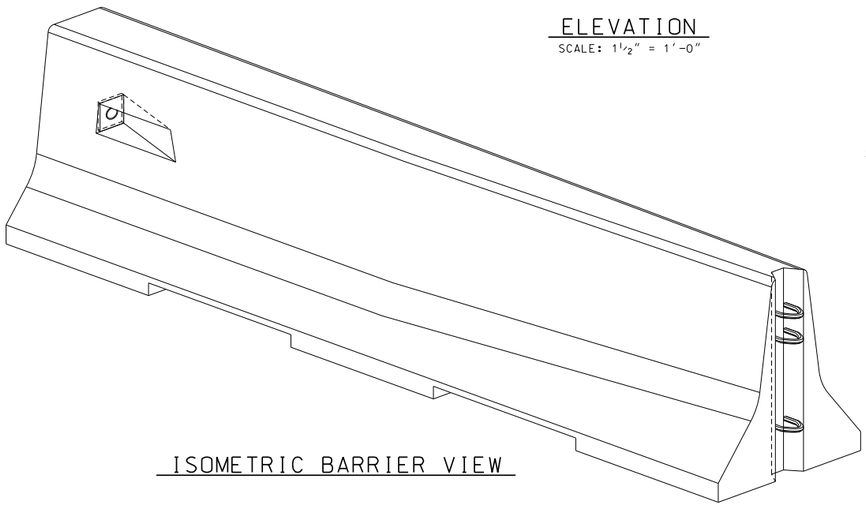
SECTION A-A

SCALE: 1½" = 1'-0"

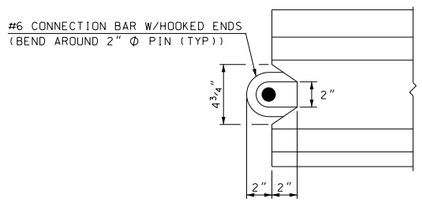


VIEW B-B

SCALE: 1½" = 1'-0"

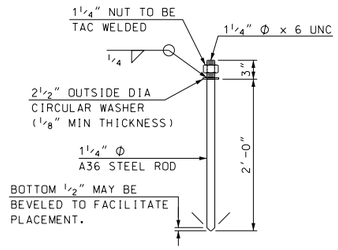


ISOMETRIC BARRIER VIEW



END NOTCH DETAIL (AT VIEW B-B)

SCALE: 2" = 1'-0"



CONNECTOR PIN ASSEMBLY

SCALE: 1" = 1'-0"

NOTES

1. TEXAS RESTRAINED BARRIER (TRANSISTION UNIT) SHALL BE PAID FOR UNDER ITEM 606.41741, PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE).
2. SEE SHEET 1 OF 3 FOR NOTES AND SHEET 2 OF 3 FOR REBAR SCHEDULE.

BARRIER WEIGHT APPROX. 2.28 TONS

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

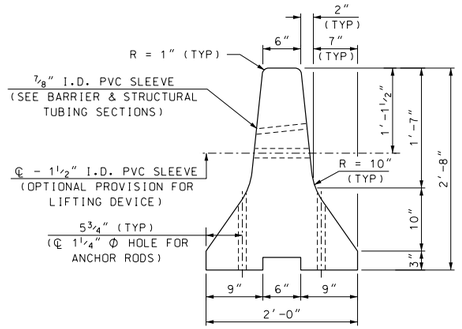
TEXAS RESTRAINED BARRIER (X-BOLT) (3 OF 3)

BRIDGE SHEET - OF -

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	TXDOT	12/10	CHECKED	NHDOT	4/18
	DRAWN	GMC	1/18	CHECKED	NHDOT	4/18
	QUANTITIES	XXX	XX/XX	CHECKED	XXX	XX/XX
	ISSUE DATE	5/15/18	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE		----------		44	46

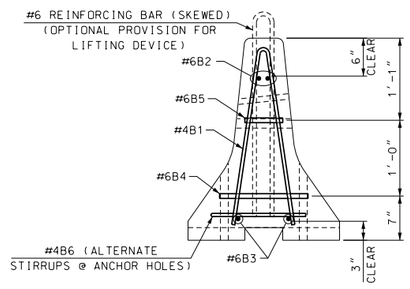
FILE NUMBER 8-1-1

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
standard\english\barrier	X-BoltBarrier	AS NOTED



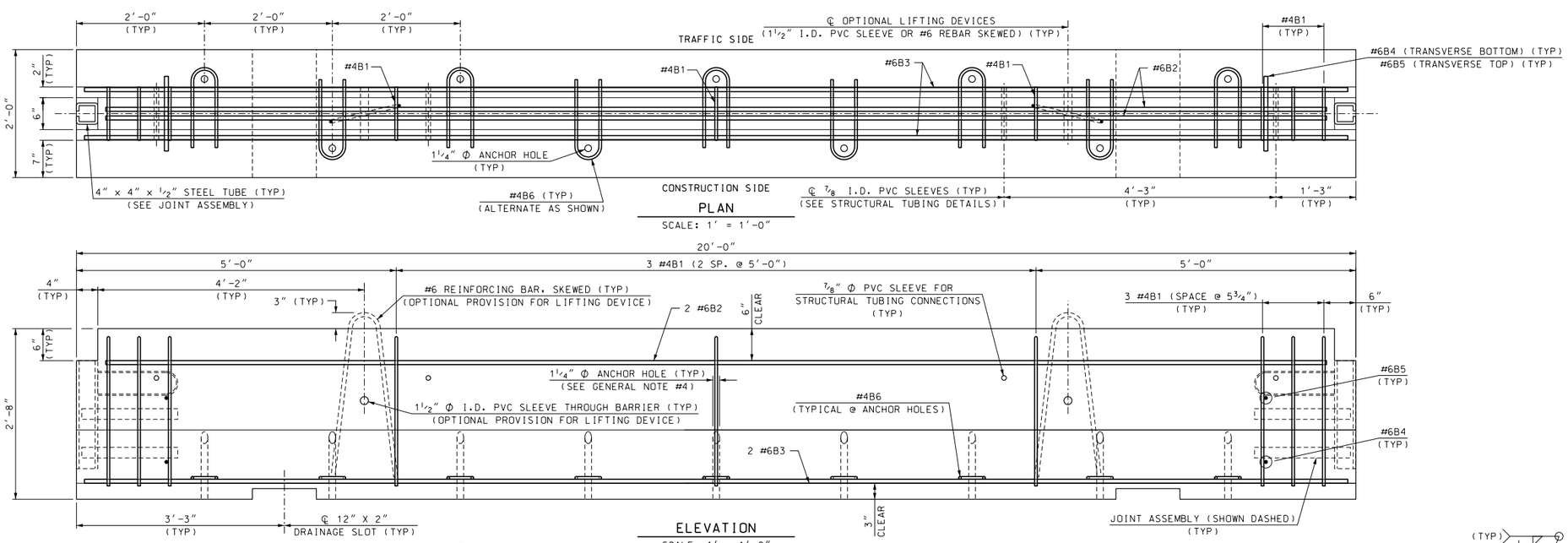
TYPICAL SECTION

SCALE: 1" = 1'-0"



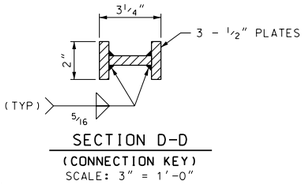
TYPICAL SECTION

SCALE: 1" = 1'-0"



ELEVATION

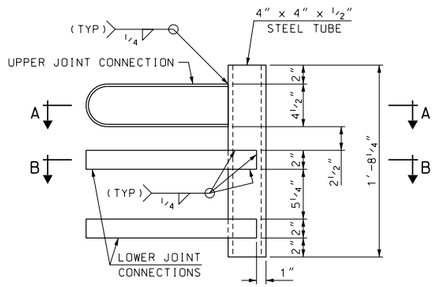
SCALE: 1' = 1'-0"



SECTION D-D

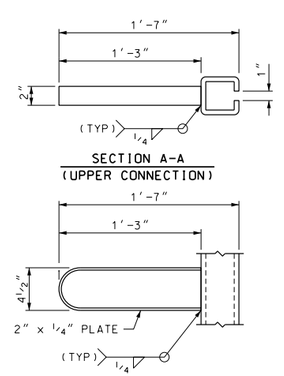
(CONNECTION KEY)

SCALE: 3" = 1'-0"



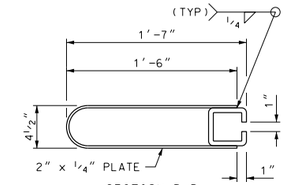
JOINT ASSEMBLY

SCALE: 1 1/2" = 1'-0"



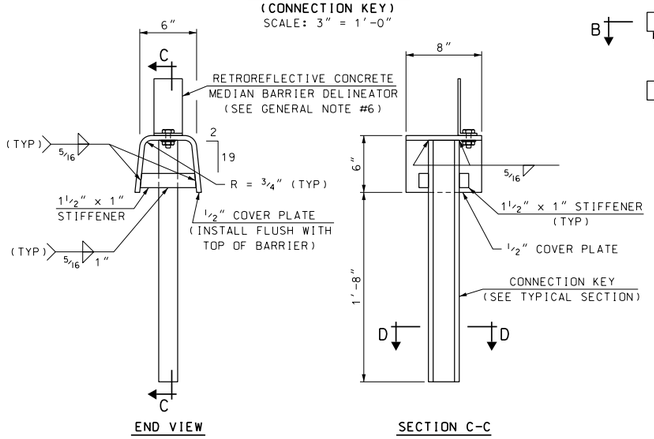
SECTION A-A

(UPPER CONNECTION)



SECTION B-B

(LOWER CONNECTION)

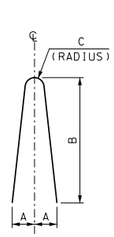


END VIEW

SECTION C-C

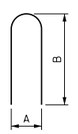
CONNECTION KEY ASSEMBLY DETAILS

SCALE: 1 1/2" = 1'-0"



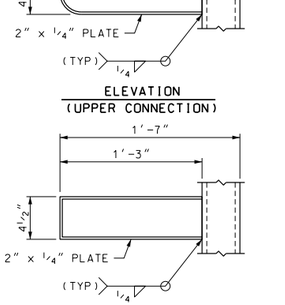
TYPE "I" REBAR

NOT TO SCALE



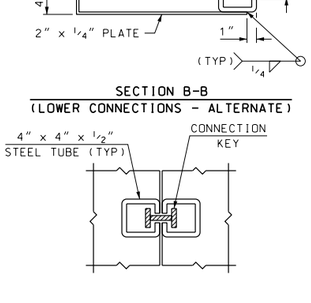
TYPE "II" REBAR

NOT TO SCALE



ELEVATION

(UPPER CONNECTION)



SECTION B-B

(LOWER CONNECTIONS - ALTERNATE)

ELEVATION

(UPPER CONNECTION - ALTERNATE)

CONNECTION JOINT DETAIL

NOT TO SCALE

JOINT CONNECTION DETAILS

SCALE: 1 1/2" = 1'-0" (EXCEPT AS NOTED)

GENERAL NOTES

(1) PORTABLE CONCRETE BARRIER SHALL BE FURNISHED BY THE CONTRACTOR AND PAID FOR AS ITEM 606.41741 PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE). CONCRETE BARRIER AND ALL ATTACHMENTS SHALL BE FABRICATED IN ACCORDANCE WITH SPECIAL PROVISIONS. ALL BARRIER UNITS FOR BRACED SYSTEMS SHALL BE 20' LONG.

(2) PORTABLE CONCRETE BARRIER DETAILS, AS SHOWN IN THESE PLANS, ARE IN COMPLIANCE WITH REQUIREMENTS PER UPDATED NCHRP REPORT 350 FOR TEST NO. 3-11 (MASH TEST LEVEL 3), CRASH TESTED BY MIDWEST ROADSIDE SAFETY; NY BOX BEAM STIFFENING OF UNANCHORED TCB, MARCH 2008, AND ACCEPTED PER FHWA LETTER B-239 (11/1/2012). THE BARRIER SYSTEM HAS BEEN CRASH TESTED WITH A 27.6" DYNAMIC DEFLECTION WHICH WILL ALLOW BRACED BARRIER TO BE PLACED A MINIMUM 12" FROM THE EDGE OF BRIDGE DECK.

(3) A MINIMUM OF TWO BARRIER UNITS, WITH BRACED JOINTS ARE REQUIRED TO BE PLACED BEYOND BOTH ENDS OF THE BRIDGE WORK AREA, FOR SPEEDS GREATER THAN 45 MPH. FOR SPEEDS ≤ 45 MPH, A MINIMUM OF ONE BRACED BARRIER IS REQUIRED TO BE FULLY SET BEYOND EACH END OF BRIDGE WORK AREA.

(4) THE LAST CONCRETE BARRIER UNIT, AT EACH END OF BRACED BARRIER LAYOUT, SHALL BE ANCHORED A MINIMUM 18" BELOW THE ROADWAY SURFACE. REQUIRED 1" Φ ANCHOR RODS (A36 STEEL) SHALL BE INSTALLED WITH 5 ANCHORS ON THE TRAFFIC SIDE OF BARRIER AND 4 ON THE CONSTRUCTION SIDE. IF THE END(S) OF THE BRACED CONCRETE BARRIER SYSTEM EXTENDS 50' OR MORE BEYOND LIMITS OF BRIDGE WORK THE LAST BARRIER UNIT DOES NOT REQUIRE ANCHORAGE.

(5) PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL (BRIDGE), ITEM 606.41741, MAY BE INSTALLED WITH A 230' MINIMUM RADIUS. GAPS CREATED BETWEEN STRUCTURAL TUBES AND CONCRETE BARRIER, DURING A RADIAL LAYOUT, SHALL BE SHIMMED WITH 8" x 8" x 1/2" PLATES & FENDER WASHERS TO FIRMLY ATTACH STRUCTURAL TUBING TO BARRIER.

(6) THE CONTRACTOR SHALL FURNISH AND INSTALL APPROVED RETROREFLECTIVE DELINEATORS AT 25-FOOT INTERVALS ALONG TOP AND/OR ONE FOOT DOWN THE SIDE OF PORTABLE CONCRETE BARRIER, SUBSIDIARY TO ITEM 606.41741 (SEE STANDARD NO. DL-1 OF NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION). THE COLOR OF DELINEATORS SHALL, IN ALL INSTANCES, CONFORM TO THE COLOR OF EDGE LINE MARKINGS. DELINEATORS SUPPLEMENT, BUT DO NOT REPLACE, THE NEED FOR RETROREFLECTIVE SOLID EDGE LINE MARKINGS.

MATERIAL NOTES

(1) BARRIERS SHALL BE LIGHT COLORED CLASS AA CONCRETE, WITH MINIMUM COMPRESSIVE STRENGTH OF 4000 psi, AND SHALL HAVE A SMOOTH UNIFORM SURFACE FREE OF DEFECTS AND IRREGULARTIES. CASTING DATE SHALL BE SHOWN ON BARRIER. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.

(2) ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615) GRADE 60. ALL REINFORCEMENT SHALL HAVE 1 1/2" MINIMUM CLEAR COVER, UNLESS OTHERWISE NOTED.

(3) STRUCTURAL STEEL, EXCEPT THE STEEL TUBES, SHALL BE ASTM A36 OR A572. ALL STEEL SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 550.

(4) STEEL TUBES, 6" x 6" x 3/16" & 4" x 4" x 1/2", SHALL BE ASTM A 500 GRADE B OR C. ALL TUBES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

(5) ALL STEEL FOR CONNECTION KEY AND TRANSITION KEY ASSEMBLIES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 550.

(6) A MINIMUM OF 2 LIFTING DEVICES, EACH WITH THE CAPACITY TO LIFT A MASS OF 6 TONS (MINIMUM), SHALL BE INSTALLED TO EACH BARRIER UNIT. TWENTY FOOT LONG CONCRETE BARRIER UNITS ARE APPROXIMATELY 400 LBS./FT.

(7) DELINEATORS SHALL BE ATTACHED TO BARRIER USING AN APPROVED ADHESIVE MATERIAL OR AS SHOWN ON THIS SHEET.

REINFORCING SCHEDULE (PER 20' BARRIER UNIT)

MARK	SIZE	LENGTH	# PIECES	TYPE	A	B	C	LOCATION
B1	#4	4'-10"	9	I	5"	2'-4"	1"	STIRRUPS
B2	#6	19'-1"	2	——				LONGITUDINAL (TOP)
B3	#6	19'-9"	2	——				LONGITUDINAL (BOTTOM)
B4	#6	1'-2"	2	——				TRANSVERSE (BOTTOM)
B5	#6	6"	2	——				TRANSVERSE (TOP)
B6	#4	2'-9"	9	II	5"	1'-3"		STIRRUPS

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BARRIER	PCB-BRACED	AS NOTED

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

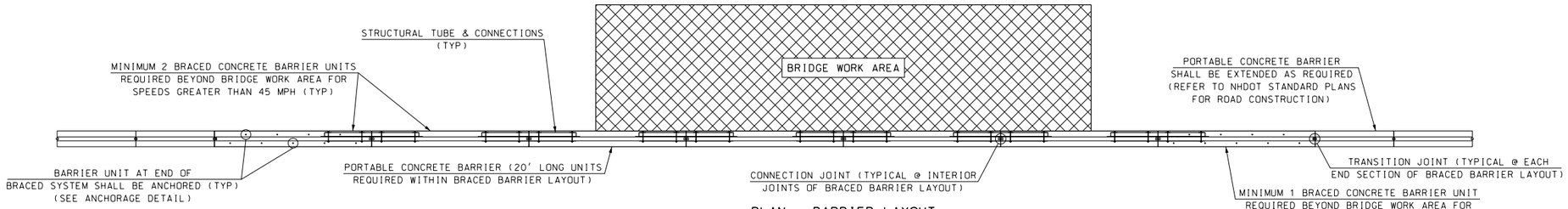
LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PORTABLE CONCRETE BARRIER - BRACED (1 OF 2)

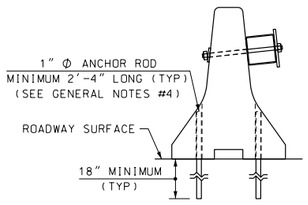
BRIDGE SHEET - OF -

REVISIONS AFTER PROPOSAL		BY	DATE		BY	DATE
	DESIGNED	NHDOT	7/12	CHECKED	ABH	8/12
	DRAWN	PJP	8/12	CHECKED	ABH	8/12
	QUANTITIES			CHECKED		
	ISSUE DATE	8/15/12	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS
	REV. DATE	5/15/18	----------		45	46

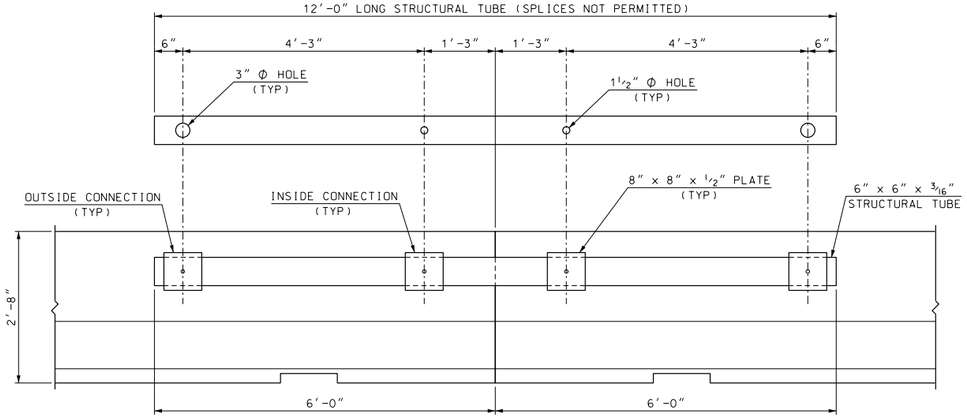
FILE NUMBER 8-1-1



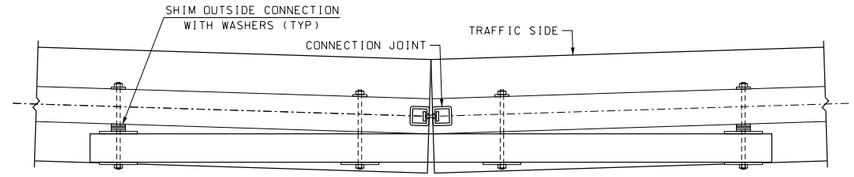
PLAN - BARRIER LAYOUT
NOT TO SCALE



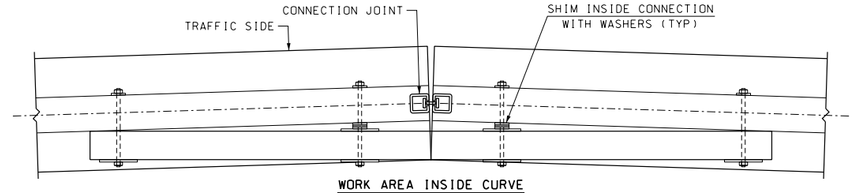
ANCHORAGE DETAIL
SCALE: 3/4" = 1'-0"



STRUCTURAL TUBING DETAILS
SCALE: 3/4" = 1'-0"



WORK AREA OUTSIDE CURVE

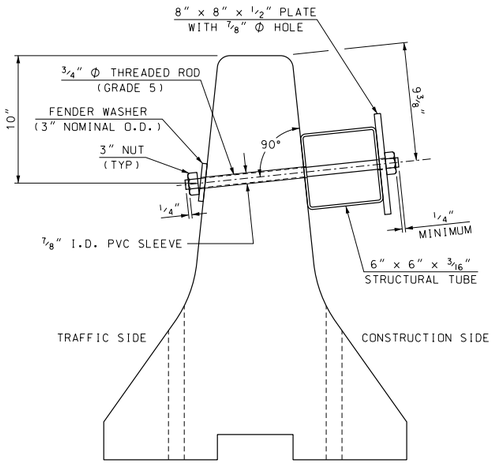


WORK AREA INSIDE CURVE

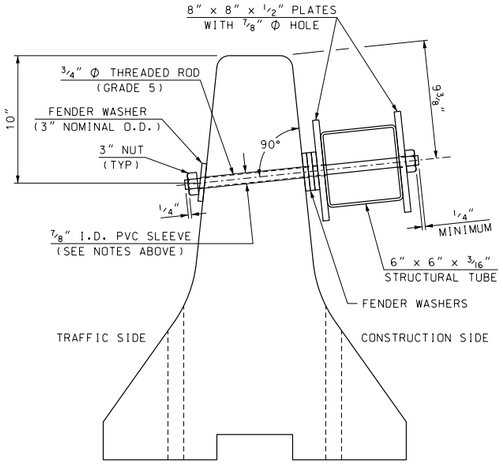
TUBE CONNECTIONS (CURVED ALIGNMENT)
SCALE: 3/4" = 1'-0"

PVC SLEEVE OPENINGS SHALL BE MODIFIED/DRILLED AS REQUIRED TO PROPERLY ALIGN STRUCTURAL TUBE BRACING UNITS FOR CURVED ALIGNMENTS

THE PRESENCE OF NORMAL HOLES WHICH HAVE BEEN MODIFIED/DRILLED WILL NOT AFFECT THE REUSE OF CONCRETE BARRIER UNITS

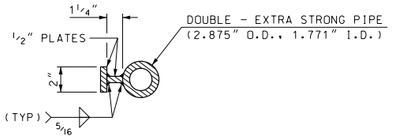


SECTION WITHOUT SHIMS

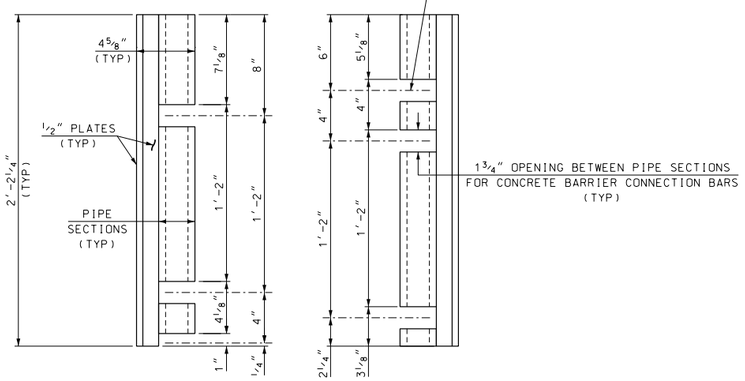


SECTION WITH SHIMS

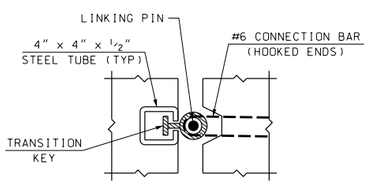
BARRIER & STRUCTURAL TUBING SECTIONS
SCALE: 2" = 1'-0"



TYPICAL SECTION
(TRANSITION KEY)
SCALE: 2" = 1'-0"



TRANSITION KEY ELEVATIONS
SCALE: 2" = 1'-0"



TRANSITION JOINT DETAILS
NOT TO SCALE

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

TOWN BEDFORD - MANCHESTER — BRIDGE NO. 199/128 & 199/129 STATE PROJECT 40731

LOCATION I-293 & NH ROUTE 101 OVER MERRIMACK RIVER AND PAN AM RAILROAD

PORTABLE CONCRETE BARRIER - BRACED (2 OF 2)

BRIDGE SHEET - OF -

REVISIONS AFTER PROPOSAL	BY	DATE

	BY	DATE		BY	DATE
DESIGNED	NHDOT	7/12	CHECKED	ABH	8/12
DRAWN	PJP	8/12	CHECKED	ABH	8/12
QUANTITIES			CHECKED		

FILE NUMBER 8-1-1

ISSUE DATE	8/15/12	FEDERAL PROJECT NO.	SHEET NO.
REV. DATE	5/15/18	----------	46

TOTAL SHEETS 46

SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
English/BARRIER	PCB-BRACED	AS NOTED